

## Lever-Type Dial Indicators DIAL TEST INDICATORS



Products

# Enhanced Durability, Sensitivity and Readability



## Inspection

- The QR code is used by the factory to accurately match the inspection certificate to the test indicator.



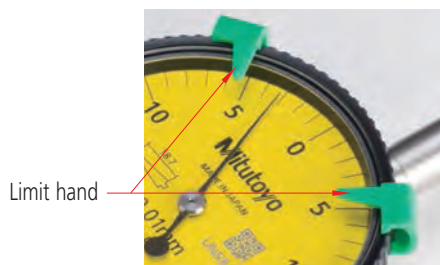
## Stylus length is marked on the dial face

- Stylus length is marked on the dial face to assist customers when ordering replacement styli.



## Attachable limit hands

- Limit hands (optional) can be attached to the bezel, allowing easy identification of the upper and lower limits of tolerance.



## ø8/ø9.52 stem to fit dovetails is a standard accessory

- A ø8mm (ø0.315 in) plain stem (**21CAB104**) for the Metric models or a ø9.52mm (ø3/8 in) plain stem (**21CAB105**) for the Inch models that attaches to any dovetail on the frame is supplied as a standard accessory. Other sizes are available as optional accessories:

ø4mm (ø0.157 in) stem: **21CAB106**

ø6mm (ø0.236 in) stem: **21CAB103**



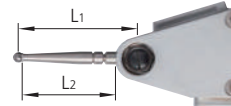
## certificate provided

| CERTIFICATE OF INSPECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Product name: DMR Test Indicator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Serial No.: 1000000     | Certificate No.: 4240173530 | Temperature: 20°C (Standard temperature) |         |      |       |       |         |                   |    |      |        |  |                    |    |     |        |  |               |    |     |        |  |                    |    |     |        |  |                        |    |     |        |  |                    |    |     |        |  |                   |    |     |        |  |                     |    |     |        |  |                      |    |     |        |  |                      |    |     |        |  |                           |    |     |        |  |                                |    |     |        |  |                             |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  | 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| Circle No.: 20-40A-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Scale interval: 0.01 mm | Measuring range: 0.0 mm     | Measuring range: 0.0 mm                  |         |      |       |       |         |                   |    |      |        |  |                    |    |     |        |  |               |    |     |        |  |                    |    |     |        |  |                        |    |     |        |  |                    |    |     |        |  |                   |    |     |        |  |                     |    |     |        |  |                      |    |     |        |  |                      |    |     |        |  |                           |    |     |        |  |                                |    |     |        |  |                             |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  | 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| <table border="1"> <thead> <tr> <th>Item</th> <th>Unit</th> <th>Value</th> <th>Error</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1. Scale interval</td> <td>mm</td> <td>0.01</td> <td>±0.001</td> <td></td> </tr> <tr> <td>2. Measuring range</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>3. Scale zero</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>4. Scale linearity</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>5. Scale repeatability</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>6. Scale stability</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>7. Scale accuracy</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>8. Scale resolution</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>9. Scale sensitivity</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>10. Scale durability</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>11. Scale wear resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>12. Scale corrosion resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>13. Scale impact resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>14. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>15. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>16. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>17. Scale salt crystal resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>18. Scale oil resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>19. Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>20. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>21. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>22. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>23. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>24. Scale salt crystal resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>25. Scale oil resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>26. Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>27. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>28. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>29. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>30. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>31. Scale salt crystal resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>32. Scale oil resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>33. Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>34. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>35. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>36. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>37. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>38. 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Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>76. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>77. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>78. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>79. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>80. Scale salt crystal resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>81. Scale oil resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>82. Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>83. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>84. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>85. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>86. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>87. Scale salt crystal resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>88. Scale oil resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>89. Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>90. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>91. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>92. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>93. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>94. Scale salt crystal resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>95. Scale oil resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>96. Scale dust resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>97. Scale shock resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>98. Scale vibration resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>99. Scale temperature resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> <tr> <td>100. Scale humidity resistance</td> <td>mm</td> <td>0.0</td> <td>±0.001</td> <td></td> </tr> </tbody> </table> |                         |                             |                                          | Item    | Unit | Value | Error | Remarks | 1. Scale interval | mm | 0.01 | ±0.001 |  | 2. Measuring range | mm | 0.0 | ±0.001 |  | 3. Scale zero | mm | 0.0 | ±0.001 |  | 4. Scale linearity | mm | 0.0 | ±0.001 |  | 5. Scale repeatability | mm | 0.0 | ±0.001 |  | 6. Scale stability | mm | 0.0 | ±0.001 |  | 7. Scale accuracy | mm | 0.0 | ±0.001 |  | 8. Scale resolution | mm | 0.0 | ±0.001 |  | 9. Scale sensitivity | mm | 0.0 | ±0.001 |  | 10. Scale durability | mm | 0.0 | ±0.001 |  | 11. Scale wear resistance | mm | 0.0 | ±0.001 |  | 12. Scale corrosion resistance | mm | 0.0 | ±0.001 |  | 13. Scale impact resistance | mm | 0.0 | ±0.001 |  | 14. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 15. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 16. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 17. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 18. Scale oil resistance | mm | 0.0 | ±0.001 |  | 19. Scale dust resistance | mm | 0.0 | ±0.001 |  | 20. Scale shock resistance | mm | 0.0 | ±0.001 |  | 21. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 22. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 23. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 24. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 25. Scale oil resistance | mm | 0.0 | ±0.001 |  | 26. Scale dust resistance | mm | 0.0 | ±0.001 |  | 27. Scale shock resistance | mm | 0.0 | ±0.001 |  | 28. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 29. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 30. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 31. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 32. Scale oil resistance | mm | 0.0 | ±0.001 |  | 33. Scale dust resistance | mm | 0.0 | ±0.001 |  | 34. Scale shock resistance | mm | 0.0 | ±0.001 |  | 35. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 36. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 37. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 38. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 39. Scale oil resistance | mm | 0.0 | ±0.001 |  | 40. Scale dust resistance | mm | 0.0 | ±0.001 |  | 41. Scale shock resistance | mm | 0.0 | ±0.001 |  | 42. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 43. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 44. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 45. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 46. Scale oil resistance | mm | 0.0 | ±0.001 |  | 47. Scale dust resistance | mm | 0.0 | ±0.001 |  | 48. Scale shock resistance | mm | 0.0 | ±0.001 |  | 49. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 50. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 51. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 52. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 53. Scale oil resistance | mm | 0.0 | ±0.001 |  | 54. Scale dust resistance | mm | 0.0 | ±0.001 |  | 55. Scale shock resistance | mm | 0.0 | ±0.001 |  | 56. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 57. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 58. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 59. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 60. Scale oil resistance | mm | 0.0 | ±0.001 |  | 61. Scale dust resistance | mm | 0.0 | ±0.001 |  | 62. Scale shock resistance | mm | 0.0 | ±0.001 |  | 63. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 64. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 65. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 66. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 67. Scale oil resistance | mm | 0.0 | ±0.001 |  | 68. Scale dust resistance | mm | 0.0 | ±0.001 |  | 69. Scale shock resistance | mm | 0.0 | ±0.001 |  | 70. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 71. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 72. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 73. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 74. Scale oil resistance | mm | 0.0 | ±0.001 |  | 75. Scale dust resistance | mm | 0.0 | ±0.001 |  | 76. Scale shock resistance | mm | 0.0 | ±0.001 |  | 77. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 78. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 79. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 80. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 81. Scale oil resistance | mm | 0.0 | ±0.001 |  | 82. Scale dust resistance | mm | 0.0 | ±0.001 |  | 83. Scale shock resistance | mm | 0.0 | ±0.001 |  | 84. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 85. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 86. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 87. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 88. Scale oil resistance | mm | 0.0 | ±0.001 |  | 89. Scale dust resistance | mm | 0.0 | ±0.001 |  | 90. Scale shock resistance | mm | 0.0 | ±0.001 |  | 91. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 92. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 93. Scale humidity resistance | mm | 0.0 | ±0.001 |  | 94. Scale salt crystal resistance | mm | 0.0 | ±0.001 |  | 95. Scale oil resistance | mm | 0.0 | ±0.001 |  | 96. Scale dust resistance | mm | 0.0 | ±0.001 |  | 97. Scale shock resistance | mm | 0.0 | ±0.001 |  | 98. Scale vibration resistance | mm | 0.0 | ±0.001 |  | 99. Scale temperature resistance | mm | 0.0 | ±0.001 |  | 100. Scale humidity resistance | mm | 0.0 | ±0.001 |  |
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Unit                    | Value                       | Error                                    | Remarks |      |       |       |         |                   |    |      |        |  |                    |    |     |        |  |               |    |     |        |  |                    |    |     |        |  |                        |    |     |        |  |                    |    |     |        |  |                   |    |     |        |  |                     |    |     |        |  |                      |    |     |        |  |                      |    |     |        |  |                           |    |     |        |  |                                |    |     |        |  |                             |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |           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    |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |                                   |    |     |        |  |                          |    |     |        |  |                           |    |     |        |  |                            |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                                |    |     |        |  |
| 1. Scale interval                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| 2. 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| 3. 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| 4. 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| 5. 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| 6. 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| 7. 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| 8. 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| 9. 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| 10. 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| 11. 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| 12. Scale corrosion resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 13. Scale impact resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| 14. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 15. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 16. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 17. 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| 18. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 19. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 20. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 21. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 22. 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| 23. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 24. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 25. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 26. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 27. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 28. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 29. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 30. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 31. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 32. 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| 33. 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| 34. 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| 35. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 36. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 37. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 38. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 39. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 40. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 41. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 42. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 43. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 44. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 45. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 46. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 47. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 48. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 49. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 50. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 51. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 52. 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| 53. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 54. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 55. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 56. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 57. 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| 58. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 59. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 60. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 61. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 62. 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| 63. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 64. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 65. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 66. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 67. 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| 68. 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| 69. 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| 70. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 71. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 72. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 73. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 74. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 75. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 76. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 77. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 78. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 79. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 80. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 81. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 82. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 83. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 84. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 85. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 86. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 87. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 88. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 89. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 90. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 91. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 92. 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| 93. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 94. Scale salt crystal resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 95. Scale oil resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 96. Scale dust resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 97. Scale shock resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | mm                      | 0.0                         | ±0.001                                   |         |      |       |       |         |                   |    |      |        |  |                    |    |     |        |  |               |    |     |        |  |                    |    |     |        |  |                        |    |     |        |  |                    |    |     |        |  |                   |    |     |        |  |                     |    |     |        |  |                      |    |     |        |  |                      |    |     |        |  |                           |    |     |        |  |                                |    |     |        |  |                             |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |       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| 98. Scale vibration resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 99. Scale temperature resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 100. Scale humidity resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | mm                      | 0.0                         | ±0.001                                   |         |      |       |       |         |                   |    |      |        |  |                    |    |     |        |  |               |    |     |        |  |                    |    |     |        |  |                        |    |     |        |  |                    |    |     |        |  |                   |    |     |        |  |                     |    |     |        |  |                      |    |     |        |  |                      |    |     |        |  |                           |    |     |        |  |                                |    |     |        |  |                             |    |     |        |  |                                |    |     |        |  |                                  |    |     |        |  |                               |    |     |        |  |        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## Extended stylus length for 0.001mm, 0.002mm, and 0.0001" graduation models

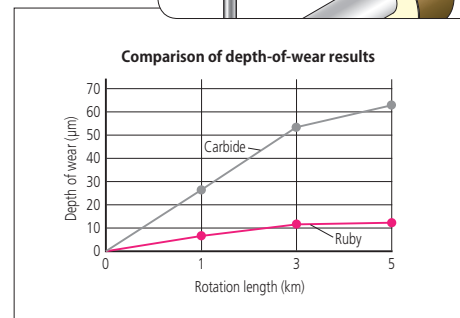
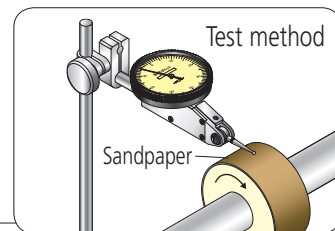
- Longer styli for the most sensitive indicators allow access to difficult-to-measure features.

0.001mm graduation models: L2 now 15.2mm, was 11.2mm  
 0.002mm graduation models: L2 now 11.2mm, was 9.4mm  
 0.0001 in graduation models: L2 now 0.61 in, was 0.45 in



## Ruby ball-tipped stylus added

- A ruby tip has wear-resistance several times greater than a carbide tip and, since it is nonconductive, it can be used safely on an electrical discharge machine.



# Enhanced Durability, Sensitivity and Readability



## Crystal for readability

- Glare-free flat crystal face allows easy reading of graduations.



Conventional

New

## Prevents dust and oil from penetrating the dial face

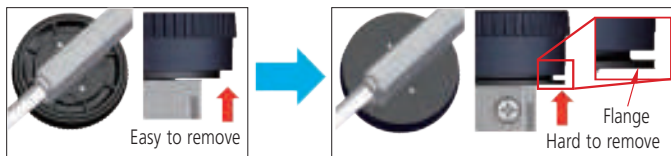
- The O-ring seal on the bezel provides smooth rotation and prevents dust and oil from penetrating the dial face.

## Bonded bezel and crystal

- Bonding the bezel and crystal eliminates a gap for cutting fluid or oil to penetrate the dial face.

## Prevents bezel detachment

- A flange prevents the bezel from unintentionally being removed during handling.



Conventional

New

## Maintain trackability

- The ability of the indicator to track small changes in displacement deteriorates with prolonged use due to minute changes in clearance between the gears. Redesigned mounting for the gears enables the ability to maintain good trackability.

## Improved readability

- Using universal fonts, changing dial face color and reviewing the relationship between pointer and scale marks have drastically improved readability.



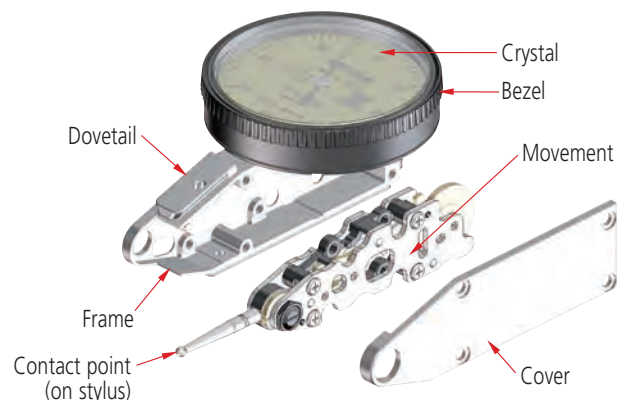
Conventional



New



## Parts



## Choice of dial position

Four models are available, each with a different orientation of the dial to allow the best visibility in any situation.

- Horizontal (standard model) - dial is on top of the frame.
- Vertical: dial is on the end of the frame.
- Horizontal (20° tilted face): dial is on top of the frame but tilted 20°.
- Parallel: dial is on the side of the frame.



## Multi-layer coatings on the crystal

- Hard, antifouling and non-glare coatings on the crystal inhibit scratches, contamination and glare on the surface.

## Improved stylus bearing

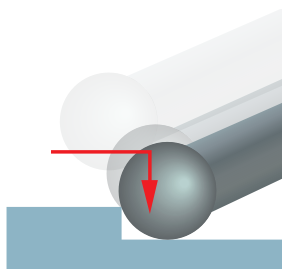
- The conventional method of mounting the stylus pivot bearing screw in the frame is prone to loosen with prolonged use. A unique sub-plate structure has been incorporated in all models to eliminate this issue.



Stylus bearing screw held in frame.



Stylus bearing screw held in sub-plate.



Indicator trackability depends on maintaining gear-train stability

## Set Configuration

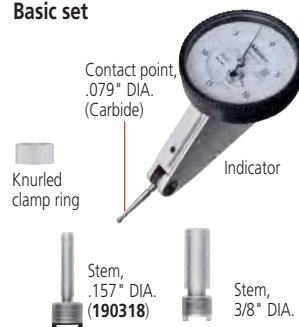
Inch

### Full set



T set

### Basic set



E set

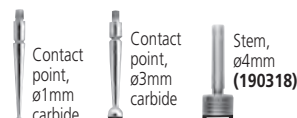
Metric

### Full set



T set

### Plus set



A set

C set  
(ø 6 Stem)

### Basic set



E set

H set  
(ø 6 Stem)



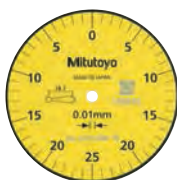
## Horizontal (Standard model)

**Metric** Wide variations of models conform to the required accuracy, range and surface of workpieces.



513-424-10

Contact point No. 137557



Graduation: 0.01mm  
Range: 0.5mm

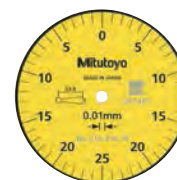
513-424-10E/513-424-10A/  
513-424-10T

- Standard
- Double scale spacing
- Carbide contact point (Anti-magnet)



513-414-10

Contact point No. 131324



Graduation: 0.01mm  
Range: 0.5mm

513-414-10E/513-414-10A/  
513-414-10T

- Long stylus
- Carbide contact point (Anti-magnet)
- Double scale spacing



513-478-10

Contact point No. 21CZA210



Graduation: 0.01mm  
Range: 0.5mm

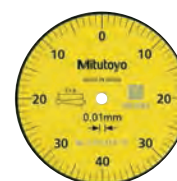
513-478-10E

- Ruby contact point (non-magnet)
- Standard
- Double scale spacing



513-474-10

Contact point No. 21CZA201



Graduation: 0.01mm  
Range: 0.8mm

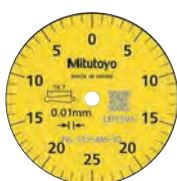
513-474-10E

- Ruby contact point (non-magnet)
- Standard



513-466-10

Contact point No. 137557



Graduation: 0.01mm  
Range: 0.5mm

513-466-10E

- Small face diameter
- Double scale spacing
- Compact
- Carbide contact point (Anti-magnet)



513-464-10

Contact point No. 103006



Graduation: 0.01mm  
Range: 0.8mm

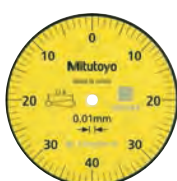
513-464-10E

- Small face diameter
- Compact
- Carbide contact point (Anti-magnet)



513-404-10

Contact point No. 103006



Graduation: 0.01mm  
Range: 0.8mm

513-404-10E/513-404-10A/  
513-404-10T/513-404-10C

- Standard
- Carbide contact point (Anti-magnet)



513-415-10

Contact point No. 136013



Graduation: 0.01mm  
Range: 1.0mm

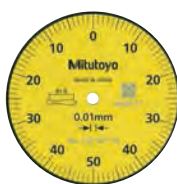
513-415-10E/513-415-10A/  
513-415-10T

- Long stylus
- Carbide contact point (Anti-magnet)



513-477-10

Contact point No. 21CZA211



Graduation: 0.01mm  
Range: 1.0mm

513-477-10E

Ruby contact point (non-magnet)

Long stylus



513-475-10

Contact point No. 21CZB068



Graduation: 0.002mm  
Range: 0.2mm

513-475-10E

Ruby contact point (non-magnet)

Standard



513-426-10

Contact point No. 137557



Graduation: 0.01mm  
Range: 1.5mm

513-426-10E/513-426-10A

With revolution counter

Double scale spacing

Carbide contact point (Anti-magnet)



513-425-10

Contact point No. 103011



Graduation: 0.002mm  
Range: 0.6mm

513-425-10E/513-425-10A

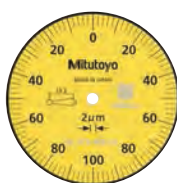
With revolution counter

Carbide contact point (Anti-magnet)



513-405-10

Contact point No. 103011



Graduation: 0.002mm  
Range: 0.2mm

513-405-10E/513-405-10A/  
513-405-10T

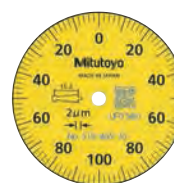
Standard

Carbide contact point (Anti-magnet)



513-465-10

Contact point No. 103011



Graduation: 0.002mm  
Range: 0.2mm

513-465-10E

Small face diameter

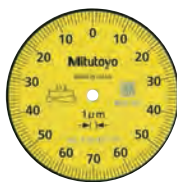
Compact

Carbide contact point (Anti-magnet)



513-471-10

Contact point No. 21CZA209



Graduation: 0.001mm  
Range: 0.14mm

513-471-10E

Ruby contact point (non-magnet)

High accuracy



513-401-10

Contact point No. 103010



Graduation: 0.001mm  
Range: 0.14mm

513-401-10E

High accuracy

Carbide contact point (Anti-magnet)



## Horizontal (Standard model)

Inch



513-402-10

Contact point No. 133195



Graduation: 0.0005 in  
Range: 0.03 in

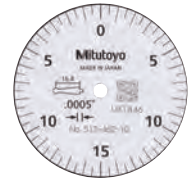
513-402-10E/513-402-10T

- Standard
- Carbide contact point (Anti-magnet)



513-462-10

Contact point No. 133195



Graduation: 0.0005 in  
Range: 0.03 in

513-462-10E

- Compact
- Carbide contact point (Anti-magnet)



513-472-10

Contact point No. 21CZA204



Graduation: 0.0005 in  
Range: 0.03 in

513-472-10E

- Standard
- Ruby contact point (non-magnet)



513-403-10

Contact point No. 21CZB064



Graduation: 0.0001 in  
Range: 0.008 in

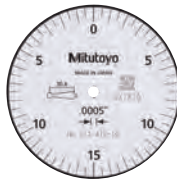
513-403-10E/513-403-10T

- Standard
- Anti-magnet (non-magnet)



513-412-10

Contact point No. 136290



Graduation: 0.0005 in  
Range: 0.03 in

513-412-10E/513-412-10T

- Long stylus
- Carbide contact point (Anti-magnet)



513-473-10

Contact point No. 21CZB112



Graduation: 0.0001 in  
Range: 0.008 in

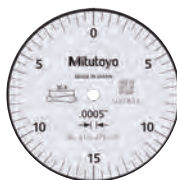
513-473-10E

- Standard
- Ruby contact point (non-magnet)



512-479-10

Contact point No. 21CZA214



Graduation: 0.0005 in  
Range: 0.03 in

512-479-10E

- Long stylus
- Ruby contact point (non-magnet)



513-463-10

Contact point No. 21CZB064



Graduation: 0.0001 in  
Range: 0.008 in

513-463-10E

- Compact
- Carbide contact point (Anti-magnet)

**Metric/Inch**



513-409-10

Contact point No. 103011



Graduation: 0.002mm/0.0001 in  
Range: 0.2mm/0.0076 in

513-409-10E/513-409-10T

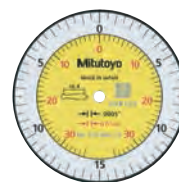
Carbide contact point (Anti-magnet)

**Inch/Metric**



513-406-10

Contact point No. 133195



Graduation: 0.0005 in/0.01mm  
Range: 0.03 in/0.7mm

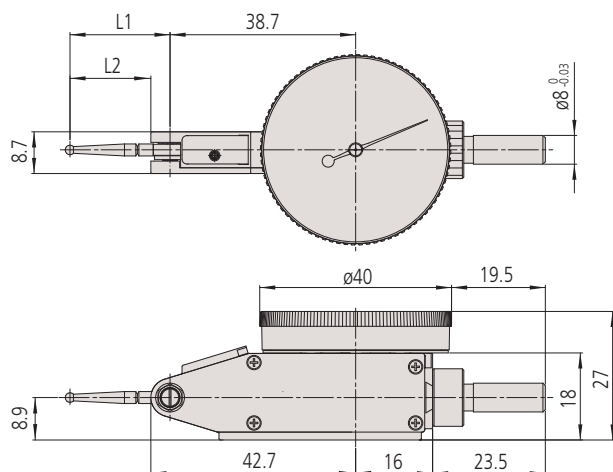
513-406-10E/513-406-10T

Carbide contact point (Anti-magnet)

**DIMENSIONS**

**Vertical**

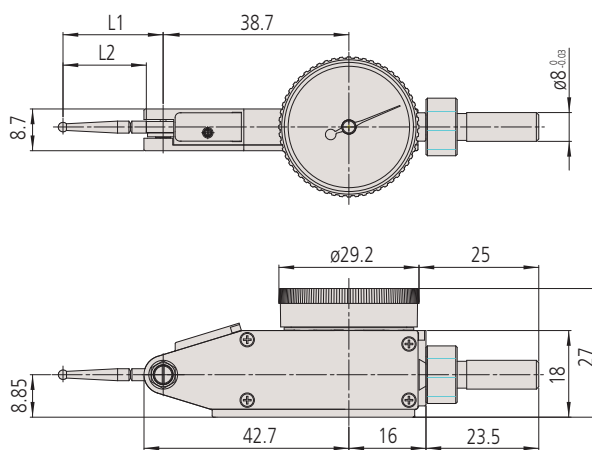
Unit: mm



| Type     | Order No.       | L1   | L2   |
|----------|-----------------|------|------|
| Vertical | 513-401-10E     | 14.7 | 11.2 |
|          | 513-471-10E     |      |      |
|          | 513-405-10E/A/T |      |      |
|          | 513-415-10E/A   | 18.7 | 15.2 |
|          | 513-475-10E     |      |      |
|          | 513-404-10E/A/T |      |      |
|          | 513-474-10E     | 20.9 | 17.4 |
|          | 513-424-10E/A/T |      |      |
|          | 513-426-10E/A   |      |      |
|          | 513-478-10E     | 22.2 | 18.7 |
|          | 513-414-10E/A/T |      |      |
|          | 513-415-10E/A/T |      |      |
|          | 513-477-10E     | 44.5 | 41.0 |

**Compact**

Unit: mm



| Type    | Order No.   | L1   | L2   |
|---------|-------------|------|------|
| Compact | 513-465-10E | 18.7 | 15.2 |
|         | 513-464-10E | 20.9 | 17.4 |
|         | 513-466-10E | 22.2 | 18.7 |



## Horizontal (Standard model)

### SPECIFICATIONS

#### Metric

| Order No.          |                    |                    | Graduation | Range                    | Dial reading             | Indication accuracy      |                    |            |               | Mass                                | Measuring force                     |  High accuracy |  With revolution counter |  Long stylus |  Standard |  Double scale spacing |  Compact |  Carbide contact point (Anti-magnet) |  Ruby contact point (non-magnet) |                                     |
|--------------------|--------------------|--------------------|------------|--------------------------|--------------------------|--------------------------|--------------------|------------|---------------|-------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Basic set          | Plus set           | Full set           |            |                          |                          | Measuring range          | 10 scale divisions | Hysteresis | Repeatability |                                     |                                     |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |                                     |
| <b>513-424-10E</b> | <b>513-424-10A</b> | <b>513-424-10T</b> | 0.01 mm    | 0.5 mm                   | 0-25-0                   | 6 μm                     | 4 μm               | 3 μm       | 45g           | 0.3N or less                        | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input checked="" type="checkbox"/>                                                             | <input checked="" type="checkbox"/>                                                          | <input type="checkbox"/>                                                                                 | <input checked="" type="checkbox"/>                                                         | <input type="checkbox"/>                                                                                                | <input checked="" type="checkbox"/>                                                                                 |                                     |
| <b>513-478-10E</b> | —                  | —                  |            |                          |                          | 6 μm                     |                    |            |               |                                     | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input checked="" type="checkbox"/>                                                             | <input checked="" type="checkbox"/>                                                          | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                |                                                                                                                     |                                     |
| <b>513-466-10E</b> | —                  | —                  |            | 0.8 mm                   | 0-40-0                   | 9 μm                     | 4 μm               | 41g        | 0.3N or less  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input checked="" type="checkbox"/>                                                             | <input type="checkbox"/>                                                                     | <input checked="" type="checkbox"/>                                                                      | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                |                                                                                                                     |                                     |
| <b>513-404-10E</b> | <b>513-404-10A</b> | <b>513-404-10T</b> |            |                          |                          | 9 μm                     |                    |            |               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    |                                                                                                                         |                                                                                                                     |                                     |
| <b>513-414-10E</b> | <b>513-414-10A</b> | <b>513-414-10T</b> |            | 0.5 mm                   | 0-25-0                   | 10 μm                    | 5 μm               | 45g        | 0.2N or less  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input checked="" type="checkbox"/>                                                                      | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                |                                                                                                                     |                                     |
| <b>513-474-10E</b> | —                  | —                  |            | 0.8 mm                   | 0-40-0                   | 9 μm                     | 4 μm               | 41g        | 0.3N or less  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input type="checkbox"/>                                                                                 | <input checked="" type="checkbox"/>                                                         | <input type="checkbox"/>                                                                                                |                                                                                                                     |                                     |
| <b>513-464-10E</b> | —                  | —                  |            |                          |                          | 9 μm                     |                    |            |               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    |                                                                                                                         |                                                                                                                     |                                     |
| <b>513-415-10E</b> | <b>513-415-10A</b> | <b>513-415-10T</b> |            | 1.0 mm                   | 0-50-0                   | 10 μm                    | 5 μm               | 3 μm       | 45g           | 0.2N or less                        | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input type="checkbox"/>                                                                                 | <input checked="" type="checkbox"/>                                                         | <input type="checkbox"/>                                                                                                | <input type="checkbox"/>                                                                                            |                                     |
| <b>513-477-10E</b> | —                  | —                  | 10 μm      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                    |            |               |                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |                                     |
| <b>513-426-10E</b> | <b>513-426-10A</b> | —                  | 1.5 mm     | 0-25-0                   | 16 μm                    | 2 μm                     | 3 μm               | 1 μm       | 45g           | 0.4N or less                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/>                                                               | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input checked="" type="checkbox"/>                                                          | <input checked="" type="checkbox"/>                                                                      | <input type="checkbox"/>                                                                    | <input checked="" type="checkbox"/>                                                                                     |                                                                                                                     |                                     |
| <b>543-405-10E</b> | <b>543-405-10A</b> | <b>543-405-10T</b> | 0.002 mm   | 0.2 mm                   | 0-100-0                  |                          |                    |            |               |                                     | 4 μm                                | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input checked="" type="checkbox"/>                                                          | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                | <input type="checkbox"/>                                                                                            | <input checked="" type="checkbox"/> |
| <b>513-471-10E</b> | —                  | —                  | 0.001 mm   | 0.14 mm                  | 0-70-0                   |                          | 4 μm               |            | 3 μm          | 45g                                 | 0.3N or less                        | <input checked="" type="checkbox"/>                                                               | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                | <input checked="" type="checkbox"/>                                                                                 |                                     |
| <b>513-475-10E</b> | —                  | —                  |            | 0.2 mm                   | 0-70-0                   |                          |                    |            |               |                                     |                                     | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input checked="" type="checkbox"/>                                                          | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                | <input type="checkbox"/>                                                                                            | <input type="checkbox"/>            |
| <b>513-425-10E</b> | <b>513-425-10A</b> | —                  | 0.002 mm   | 0.6 mm                   | 0-100-0                  |                          | 4 μm               |            | 4 μm          | 41g                                 | 0.4N or less                        | <input type="checkbox"/>                                                                          | <input checked="" type="checkbox"/>                                                                         | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                | <input checked="" type="checkbox"/>                                                                                 | <input type="checkbox"/>            |
| <b>513-465-10E</b> | —                  | —                  |            | 0.2 mm                   | 0-100-0                  |                          |                    |            |               |                                     |                                     | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input checked="" type="checkbox"/>                                                          | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                | <input type="checkbox"/>                                                                                            | <input type="checkbox"/>            |
| <b>513-401-10E</b> | —                  | —                  | 0.001 mm   | 0.14 mm                  | 0-70-0                   | 4 μm                     | 3 μm               | 45g        | 0.3N or less  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>                                                                          | <input type="checkbox"/>                                                                                    | <input type="checkbox"/>                                                                        | <input type="checkbox"/>                                                                     | <input checked="" type="checkbox"/>                                                                      | <input type="checkbox"/>                                                                    | <input type="checkbox"/>                                                                                                |                                                                                                                     |                                     |

#### Inch

| Order No.   |          |             | Graduation | Range    | Dial reading | Indication accuracy |            |               | Mass | Measuring force | High accuracy | With revolution counter | Long stylus | Standard | Double scale spacing | Compact | Carbide contact point (Anti-magnet) | Ruby contact point (non-magnet) |
|-------------|----------|-------------|------------|----------|--------------|---------------------|------------|---------------|------|-----------------|---------------|-------------------------|-------------|----------|----------------------|---------|-------------------------------------|---------------------------------|
| Basic set   | Plus set | Full set    |            |          |              | One rev.            | Hysteresis | Repeatability |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-402-10E | -        | 513-402-10T | 0.0005 in  | 0.03 in  | 0-15-0       | ±0.0005 in          | 0.0002 in  | 0.0002 in     | 45g  | 0.3N or less    |               |                         |             |          |                      |         |                                     |                                 |
| 513-472-10E | -        | -           |            |          |              |                     |            |               |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-412-10E | -        | 513-412-10T |            |          |              |                     |            |               |      | 0.2N or less    |               |                         |             |          |                      |         |                                     |                                 |
| 513-479-10E | -        | -           |            |          |              |                     |            |               |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-462-10E | -        | -           | 0.0001 in  | 0.008 in | 0-4-0        | ±0.0001 in          | 0.0001 in  | 0.00004 in    | 41g  | 0.3N or less    |               |                         |             |          |                      |         |                                     |                                 |
| 513-403-10E | -        | 513-403-10T |            |          |              |                     |            |               |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-473-10E | -        | -           |            |          |              |                     |            |               | 45g  | 0.3N or less    |               |                         |             |          |                      |         |                                     |                                 |
| 513-463-10E | -        | -           |            |          |              |                     |            |               |      |                 |               |                         |             |          |                      |         |                                     |                                 |

#### Metric/Inch

| Order No.   |          |             | Graduation          | Range             | Dial reading    | Indication accuracy |                    |            |               | Mass | Measuring force | High accuracy | With revolution counter | Long stylus | Standard | Double scale spacing | Compact | Carbide contact point (Anti-magnet) | Ruby contact point (non-magnet) |
|-------------|----------|-------------|---------------------|-------------------|-----------------|---------------------|--------------------|------------|---------------|------|-----------------|---------------|-------------------------|-------------|----------|----------------------|---------|-------------------------------------|---------------------------------|
| Basic set   | Plus set | Full set    |                     |                   |                 | Measuring range     | 10 scale divisions | Hysteresis | Repeatability |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-409-10E | -        | 513-409-10T | 0.002mm / 0.0001 in | 0.2mm / 0.0076 in | 0-10-0 / 0-35-0 | 4µm                 | 2µm                | 3µm        | 1µm           | 45g  | 0.3N or less    |               |                         |             |          |                      |         |                                     |                                 |

#### Inch/Metric

| Order No.   |          |             | Graduation         | Range           | Dial reading    | Indication accuracy |            |               | Mass | Measuring force | High accuracy | With revolution counter | Long stylus | Standard | Double scale spacing | Compact | Carbide contact point (Anti-magnet) | Ruby contact point (non-magnet) |
|-------------|----------|-------------|--------------------|-----------------|-----------------|---------------------|------------|---------------|------|-----------------|---------------|-------------------------|-------------|----------|----------------------|---------|-------------------------------------|---------------------------------|
| Basic set   | Plus set | Full set    |                    |                 |                 | Measuring range     | Hysteresis | Repeatability |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-406-10E | -        | 513-406-10T | 0.0005 in / 0.01mm | 0.03 in / 0.7mm | 0-15-0 / 0-35-0 | ±0.0005 in          | 0.0002 in  | 0.0002 in     | 45g  | 0.3N or less    |               |                         |             |          |                      |         |                                     |                                 |

\* Stem with ø6 dovetail groove is not included in the mass.

\* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage.

In the case the of the significant deterioration during the operation, repair is required.





**Parallel** (The scale can be read from the front, with the contact point pivoting in a plane parallel to that of the dial face.)

**Mitutoyo**

### Metric



513-484-10

Contact point No. 103006



Graduation: 0.01mm  
Range: 0.8mm

513-484-10E/513-484-10A/  
513-484-10T

Carbide contact point (Anti-magnet)



513-486-10

Contact point No. 137557



Graduation: 0.01mm  
Range: 0.5mm

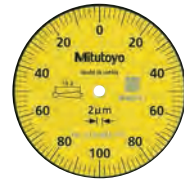
513-486-10E

Double scale spacing  
Carbide contact point (Anti-magnet)



513-485-10

Contact point No. 103011



Graduation: 0.002mm  
Range: 0.2mm

513-485-10E

Carbide contact point (Anti-magnet)



513-482-10

Contact point No. 133195



Graduation: 0.0005 in  
Range: 0.03 in

513-482-10A/513-482-10T

Carbide contact point (Anti-magnet)

## SPECIFICATIONS

### Metric

| Order No.   |             |             | Graduation | Range | Dial reading | Indication accuracy |                    |            |               | Mass | Measuring force | High accuracy | With revolution counter | Long stylus | Standard | Double scale spacing | Compact | Carbide contact point (Anti-magnet) | Ruby contact point (non-magnet) |
|-------------|-------------|-------------|------------|-------|--------------|---------------------|--------------------|------------|---------------|------|-----------------|---------------|-------------------------|-------------|----------|----------------------|---------|-------------------------------------|---------------------------------|
| Basic set   | Plus set    | Full set    |            |       |              | Measuring range     | 10 scale divisions | Hysteresis | Repeatability |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| 513-484-10E | 513-484-10A | 513-484-10T | 0.01mm     | 0.8mm | 0-40-0       | 9μm                 | 5μm                | 4μm        | 3μm           | 53g  | 0.3N or less    |               |                         |             |          |                      |         | ✓                                   |                                 |
| 513-485-10E | -           | -           | 0.002mm    | 0.2mm | 0-100-0      | 4μm                 | 2μm                | 3μm        | 1μm           |      |                 |               |                         |             |          |                      |         | ✓                                   |                                 |
| 513-486-10E | -           | -           | 0.01mm     | 0.5mm | 0-25-0       | 6μm                 | 5μm                | 4μm        | 3μm           |      |                 |               |                         |             | ✓        |                      | ✓       |                                     |                                 |

### Inch

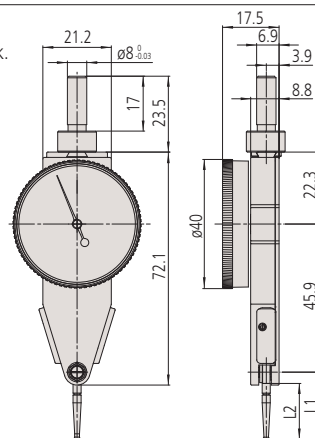
| Order No. |             |             | Graduation | Range   | Dial reading | Indication accuracy |            |               | Mass | Measuring force | High accuracy | With revolution counter | Long stylus | Standard | Double scale spacing | Compact | Carbide contact point (Anti-magnet) | Ruby contact point (non-magnet) |
|-----------|-------------|-------------|------------|---------|--------------|---------------------|------------|---------------|------|-----------------|---------------|-------------------------|-------------|----------|----------------------|---------|-------------------------------------|---------------------------------|
| Basic set | Plus set    | Full set    |            |         |              | Measuring range     | Hysteresis | Repeatability |      |                 |               |                         |             |          |                      |         |                                     |                                 |
| -         | 513-482-10A | 513-482-10T | 0.0005 in  | 0.03 in | 0-15-0       | ±0.0005 in          | 0.0002 in  | 0.0002 in     | 53g  | 0.3N or less    |               |                         |             |          |                      |         | ✓                                   |                                 |

\* Stem with ø6 dovetail groove is not included in the mass.

\* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case the of the significant deterioration during the operation, repair is required.

## DIMENSIONS

\* No dovetail in the back.



Unit: mm

| Order No.   | L1   | L2   |
|-------------|------|------|
| 513-484-10E | 20.9 | 17.4 |
| 513-485-10E | 18.7 | 15.2 |
| 513-486-10E | 22.2 | 18.7 |



**Vertical** (Best suited for centering holes under the spindle of a machine tool.)

### Metric



513-454-10E/513-454-10A/  
513-454-10T

Carbide contact  
point (Anti-magnet)



513-455-10E/513-455-10A/  
513-455-10T

Carbide contact  
point (Anti-magnet)



513-456-10E

Double scale spacing  
 Carbide contact  
point (Anti-magnet)

### Inch



513-452-10E/513-452-10T

Carbide contact  
point (Anti-magnet)



513-453-10E/513-453-10T

Carbide contact  
point (Anti-magnet)

## SPECIFICATIONS

| Metric      |             |             |            |       |              |                     |                    |            |               |      |                 |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |
|-------------|-------------|-------------|------------|-------|--------------|---------------------|--------------------|------------|---------------|------|-----------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Order No.   |             |             | Graduation | Range | Dial reading | Indication accuracy |                    |            |               | Mass | Measuring force |  High accuracy |  With revolution counter |  Long stylus |  Standard |  Double scale spacing |  Compact |  Carbide contact point (Anti-magnet) |  Ruby contact point (non-magnet) |
| Basic set   | Plus set    | Full set    |            |       |              | Measuring range     | 10 scale divisions | Hysteresis | Repeatability |      |                 |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |
| 513-454-10E | 513-454-10A | 513-454-10T | 0.01mm     | 0.8mm | 0-40-0       | 9μm                 | 5μm                | 4μm        | 3μm           | 46g  | 0.3N or less    |                |                          |              |           |                       |          |                                      |                                  |
| 513-455-10E | 513-455-10A | 513-455-10T | 0.002mm    | 0.2mm | 0-100-0      | 4μm                 | 2μm                | 3μm        | 1μm           |      |                 |                |                          |              |           |                       |          |                                      |                                  |
| 513-456-10E | —           | —           | 0.01mm     | 0.5mm | 0-25-0       | 6μm                 | 5μm                | 4μm        | 3μm           |      |                 |                |                          |              |           |                       |          |                                      |                                  |

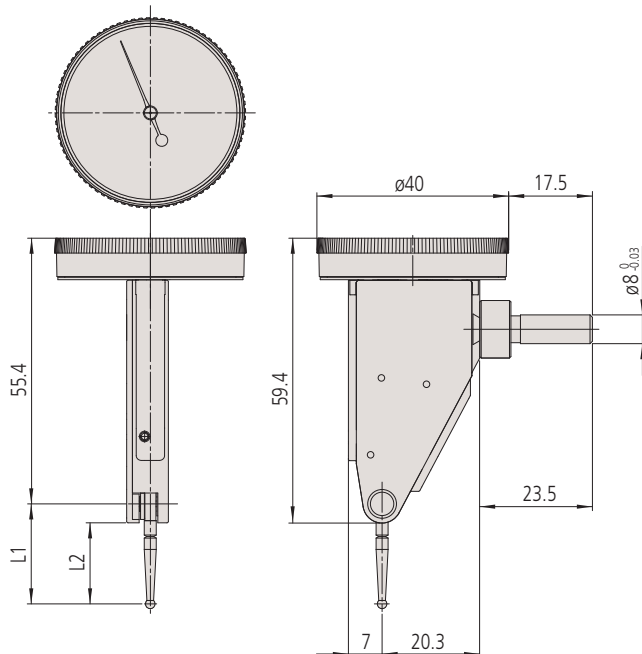
| Inch        |          |             |            |          |              |                     |            |               |      |                 |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |  |
|-------------|----------|-------------|------------|----------|--------------|---------------------|------------|---------------|------|-----------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--|
| Order No.   |          |             | Graduation | Range    | Dial reading | Indication accuracy |            |               | Mass | Measuring force |  High accuracy |  With revolution counter |  Long stylus |  Standard |  Double scale spacing |  Compact |  Carbide contact point (Anti-magnet) |  Ruby contact point (non-magnet) |  |
| Basic set   | Plus set | Full set    |            |          |              | Measuring range     | Hysteresis | Repeatability |      |                 |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |  |
| 513-452-10E | —        | 513-452-10T | 0.0005 in  | 0.03 in  | 0-15-0       | ±0.0005 in          | 0.0002 in  | 0.0002 in     | 46g  | 0.3N or less    |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |  |
| 513-453-10E | —        | 513-453-10T | 0.0001 in  | 0.008 in | 0-4-0        | ±0.0001 in          | 0.0001 in  | 0.00004 in    |      |                 |                                                                                                   |                                                                                                             |                                                                                                 |                                                                                              |                                                                                                          |                                                                                             |                                                                                                                         |                                                                                                                     |  |

\* Stem with ø6 dovetail groove is not included in the mass.

\* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case the of the significant deterioration during the operation, repair is required.

## DIMENSIONS

Unit: mm



| Order No.   | L1   | L2   |
|-------------|------|------|
| 513-454-10E | 20.9 | 17.4 |
| 513-455-10E | 18.7 | 15.2 |
| 513-456-10E | 22.2 | 18.7 |



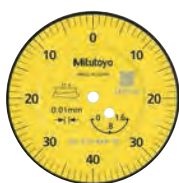
## Horizontal (20° Tilted Face) (Dial face inclined 20°, compared with the vertical type.)

### Metric



513-444-10

Contact point No. 103006



Graduation: 0.01mm  
Range: 1.6mm

513-444-10E/513-444-10A/  
513-444-10T

☒ With revolution counter

☒ Carbide contact point (Anti-magnet)



513-445-10

Contact point No. 103011



Graduation: 0.02mm  
Range: 0.4mm

513-445-10E/513-445-10A/  
513-445-10T

☒ With revolution counter

☒ Carbide contact point (Anti-magnet)

### Inch



513-442-10

Contact point No. 133195



Graduation: 0.0005 in  
Range: 0.06 in

513-442-10A/513-442-10T

☒ With revolution counter

☒ Carbide contact point (Anti-magnet)



513-442-16

Contact point No. 133195



Graduation: 0.0005 in  
Range: 0.06 in

513-442-16A/513-442-16T

☒ With revolution counter

☒ Carbide contact point (Anti-magnet)



513-446-10

Contact point No. 136290



Graduation: 0.0005 in  
Range: 0.06 in

513-446-10A/513-446-10T

☒ With revolution counter

☒ Long stylus  
☒ Carbide contact point (Anti-magnet)



513-446-16

Contact point No. 136290



Graduation: 0.0005 in  
Range: 0.06 in

513-446-16A/513-446-16T

☒ With revolution counter

☒ Long stylus  
☒ Carbide contact point (Anti-magnet)



513-443-10

Contact point No. 21CZB064



Graduation: 0.0001 in  
Range: 0.016 in

513-443-10A/513-443-10T

☒ With revolution counter

☒ Carbide contact point (Anti-magnet)



513-443-16

Contact point No. 21CZB064



Graduation: 0.0001 in  
Range: 0.016 in

513-443-16A/513-443-16T

☒ With revolution counter

☒ Carbide contact point (Anti-magnet)

## SPECIFICATIONS

### Metric

| Order No.   |             |             | Graduation | Range | Dial reading | Indication accuracy |                    |            |               | Mass | Measuring force | High accuracy                       | With revolution counter             | Long stylus                         | Standard                            | Double scale spacing                | Compact                             | Carbide contact point (Anti-magnet) | Ruby contact point (non-magnet)     |
|-------------|-------------|-------------|------------|-------|--------------|---------------------|--------------------|------------|---------------|------|-----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Basic set   | Plus set    | Full set    |            |       |              | Measuring range     | 10 scale divisions | Hysteresis | Repeatability |      |                 |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |
| 513-444-10E | 513-444-10A | 513-444-10T | 0.01mm     | 1.6mm | 0-40-0       | 16μm                | 5μm                | 5μm        | 3μm           | 48g  | 0.3N or less    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 513-445-10E | 513-445-10A | 513-445-10T | 0.002mm    | 0.4mm | 0-100-0      | 6μm                 | 2μm                | 4μm        | 1μm           |      |                 |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |

### Inch

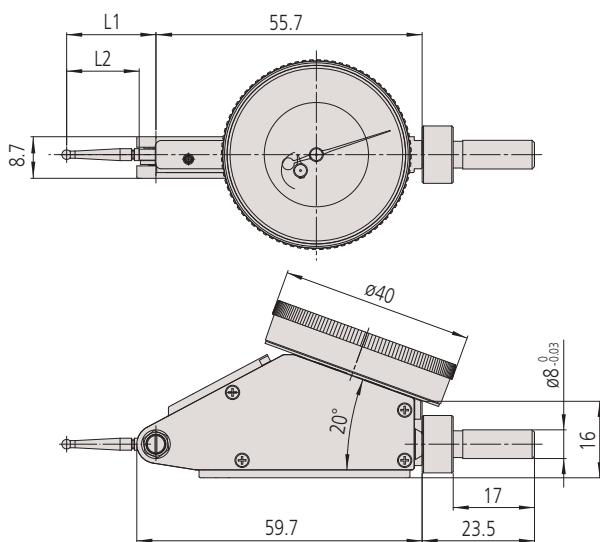
| Order No. |             |             | Graduation | Range    | Dial reading | Indication accuracy |            |               | Mass | Measuring force |  High accuracy |  With revolution counter |  Long stylus |  Standard |  Double scale spacing |  Compact |  Carbide contact point (Anti-magnet) |  Ruby contact point (non-magnet) |
|-----------|-------------|-------------|------------|----------|--------------|---------------------|------------|---------------|------|-----------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Basic set | Plus set    | Full set    |            |          |              | Measuring range     | Hysteresis | Repeatability |      |                 |                                                                                                 |                                                                                                           |                                                                                               |                                                                                            |                                                                                                        |                                                                                           |                                                                                                                       |                                                                                                                   |
| –         | 513-442-10A | 513-442-10T | 0.0005 in  | 0.06 in  | 0-15-0       | ±0.0005 in          | 0.0002 in  | 0.0002 in     | 48g  | 0.3N or less    |                |                          |                                                                                               |                                                                                            |                                                                                                        |                                                                                           |                                      |                                                                                                                   |
| –         | 513-442-16A | 513-442-16T |            |          |              |                     |            |               |      |                 |                                                                                                 |                                                                                                           |                                                                                               |                                                                                            |                                                                                                        |                                                                                           |                                                                                                                       |                                                                                                                   |
| –         | 513-446-10A | 513-446-10T |            |          |              |                     |            |               |      |                 |                                                                                                 |                                                                                                           |                                                                                               |                                                                                            |                                                                                                        |                                                                                           |                                                                                                                       |                                                                                                                   |
| –         | 513-446-16A | 513-446-16T |            |          |              |                     |            |               |      | 0.2N or less    |                |                          |              |                                                                                            |                                                                                                        |                                                                                           |                                      |                                                                                                                   |
| –         | 513-443-10A | 513-443-10T | 0.0001 in  | 0.016 in | 0-4-0        | ±0.0002 in          | 0.0001 in  | 0.00004 in    |      | 0.3N or less    |                |                          |                                                                                               |                                                                                            |                                                                                                        |                                                                                           |                                      |                                                                                                                   |
| –         | 513-443-16A | 513-443-16T |            |          |              |                     |            |               |      |                 |                |                          |                                                                                               |                                                                                            |                                                                                                        |          |                                                                                                                       |                                                                                                                   |

\* Stem with ø6 dovetail groove is not included in the mass.

\* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case of the significant deterioration during the operation, repair is required.

## DIMENSIONS

Unit: mm



| Order No.   | L1   | L2   |
|-------------|------|------|
| 513-445-10E | 18.7 | 15.2 |
| 513-444-10E | 20.9 | 17.4 |

Refer to MEASURING INSTRUMENTS CATALOG No. US-1004 for the accessories such as styli, stems with dovetail, holding bars, etc.