



PRODUCT RANGE

PRECISION MEASURING INSTRUMENTS

10/2018

SCHWENK
LÄNGENMESSTECHNIK
GMBH & CO. KG



Pictographs

LEGEND TO SYMBOLS

| | | | | | |
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Circometer®
(Reg.-No.: 429 851)

mytast®
(Reg.-No.: 702 254)

OSIMESS®
(Reg.-No.: 798 203)
are registered brand names
of SCHWENK Beteiligungs-
GmbH & Co. KG.

SUBITO®
(Reg.-No.: 508 662)
is a registered
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Werkzeuge GmbH.

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PRECISION MEASURING INSTRUMENTS

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Precision meets passion
Why we are the source of inspiration for bore measuring

Since 2014 the name SCHWENK Längenmesstechnik GmbH & Co KG stands for the design and production of high-quality precision measuring instruments. The company SCHWENK Längenmesstechnik GmbH & Co KG has its origin in the company OSKAR SCHWENK GmbH & Co. KG - one of the oldest manufacturers of precision measuring instruments in the global market.

Back in 1921 the company's founder Oskar Schwenk patented the internationally known bore gauge SUBITO. The „SUBITO“ has become a synonym for all measuring instruments of this type and still set the benchmark for quality, precision and service life. Until today tradition und innovation are inherent parts of our company philosophy – for a long time the brand SCHWENK is a source of inspiration for bore measuring. Should our comprehensive standard program prove insufficient for solving your particular measuring tasks, we can produce individual solutions for you: from modified hand-held measuring instruments over manually operated measuring devices up to fully automatic versions, which are integrated in the production cell.

You ensure your quality with our measuring instruments. It goes without saying that our own products are subject to the highest quality demands. It is guaranteed by the qualification and expert knowledge of our staff and our in-house quality control process.

We know why customer satisfaction is so important and with the conception and the design of our products we set a high value on them being service friendly and easy to maintain. Even many spare and wear mechanical parts are available for a period of many years. If a measuring instrument should fail calibration requirements after years of use, our repair and calibration department takes care of this. It can resort to our well-sorted spare parts stock and ensure a fast and easy processing and adjustment of your measuring instrument.

SUBITO® SW

SUBITO® holder

| SW | measuring pins ruby | | | holder | | |
|-----------|------------------------|------------|-----------|-----------|-----------|-----------|
| | SU | Code SK | SK | SW | SU | SK |
| - | - | - | - | - | 100 00049 | 100 00050 |
| 201 00002 | 101 00002 | 101 00003 | 201 00001 | 101 00045 | 101 00046 | 101 00046 |
| 202 00002 | 102 00002 | 102 00003 | 202 00001 | 102 00046 | 102 00047 | 102 00047 |
| 203 00002 | 103 00002 | 103 00003 | 203 00001 | 103 00055 | 103 00056 | 103 00056 |
| 204 00003 | 104 00004 | 104 00005 | 204 00002 | 104 00067 | 104 00068 | 104 00068 |
| 205 00003 | 105 00004 | 105 00005 | 205 00002 | 105 00062 | 105 00063 | 105 00063 |
| 206 00003 | 106 00004 | 106 00005 | 206 00002 | 106 00077 | 106 00078 | 106 00078 |
| 207 00003 | 107 00004 | 107 00005 | 207 00002 | 106 00077 | 106 00078 | 106 00078 |
| 208 00003 | 108 00004 | 108 00005 | 208 00002 | 108 00064 | 108 00065 | 108 00065 |
| 209 00003 | 109 00004 | 109 00005 | 209 00002 | 108 00064 | 108 00065 | 108 00065 |
| 210 00003 | 110 00004 | 110 00005 | 210 00002 | 110 00044 | 110 00045 | 110 00045 |
| 211 00003 | 111 00004 | 111 00005 | 211 00002 | 110 00044 | 110 00045 | 110 00045 |
| 212 00003 | 112 00004 | 112 00005 | 212 00002 | 112 00068 | 112 00069 | 112 00069 |
| 213 00003 | 113 00004 | 113 00005 | 213 00002 | 112 00068 | 112 00069 | 112 00069 |
| 214 00003 | 114 00004 | 114 00005 | 214 00002 | 114 00140 | 114 00141 | 114 00141 |

SUBITO® SU 4,5 - 6 and SU 35 - 60

SUBITO® segment

Measuring depth extension **MTV**

FOR SUBITO® BORE GAUGES, PLUG-IN EXTENSION,
CLAMPING SHANK Ø 8 MM

suitable from diameter 35 mm

MEASURING DEPTH EXTENSION MTV

| tube-Ø [mm] | length [mm] | Code | tube-Ø [mm] | length [mm] | Code |
|----------------|----------------|-----------|----------------|----------------|------------|
| 12 | 250 | 120 00000 | 18 | 1000 | 120 00004 |
| 12 | 500 | 120 00001 | 18 | 1500 | 120 00005 |
| 12 | 750 | 120 00002 | 18 | 2000 | 120 00006 |
| 12 | 1000 | 120 00003 | special length | | on inquiry |

Measuring depth extensions with CFK tube on inquiry.

SERIES 120

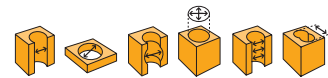


measuring depth extension MTV

SUBITO® Vario Precision Bore Gauge SV/SVS

SERIES 122-124

FOR MEASURING INTERNAL DIAMETERS,
APPLICATION RANGE 6 - 800 MM



Delivery SV:

SUBITO® Vario SV modular system consisting of one upper part and different measuring heads in Vario design; with fixed measuring pins, washers, in case, without dial gauge.

SUBITO® VARIO SV/SVS

| application range [mm] | | measuring pin steel Code | measuring pin carbide Code |
|------------------------|-------------------------------|--------------------------|----------------------------|
| type SV | measuring heads SUBITO® Vario | | |
| 6 - 18 | 6 - 10 | - | 122 00000 |
| | 10 - 18 | - | - |
| 6 - 10 | 6 - 10 | - | 122 00001 |
| | 10 - 18 | - | 122 00002 |
| 18 - 160 | 18 - 50 | 123 00000 | 123 00008 |
| | 50 - 160 | - | - |
| 18 - 50 | 18 - 50 | 123 00001 | 123 00009 |
| | 50 - 160 | 123 00002 | 123 00010 |
| 160 - 800 | 160 - 430 | 124 00000 | 124 00004 |
| | 430 - 800 | - | - |
| 160 - 430 | 160 - 430 | 124 00001 | 124 00005 |
| | 400 - 800 | 124 00002 | 124 00006 |



SUBITO® Vario SV

Delivery SVS:

as series SV, but with a short upper part and additional blind bores measuring head and measuring slides, an angle piece 90° to reach awkwardly positioned bores and a measure depth extension 192 mm; in case, without dial gauge.

SUBITO® VARIO SVS

| application range [mm] | | measuring pin steel Code | meas. pin carbide Code |
|------------------------|------------------------|--------------------------|------------------------|
| type SVS | measuring heads | | |
| 18 - 160 | SUBITO® Vario 18 - 50 | - | - |
| | SUBITO® Vario 50 - 160 | - | - |
| 18 - 160 | blind bores 20 - 50 | 123 00005 | 123 00013 |
| | blind bores 50 - 140 | - | - |



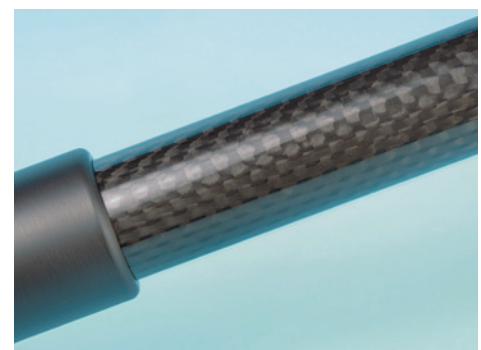
SUBITO® Vario System SVS

ACCESSORIES SV/SVS

| application range [mm] | Code |
|---------------------------------------------------------|-----------|
| 6-18 mm | |
| screw-in depth extension 250 mm long, tube-Ø 5 mm | 122 00005 |
| 18-160 mm | |
| screw-in depth extension 192 mm long, tube-Ø 10 mm | 123 00007 |
| screw-in depth extension 500 mm long, tube-Ø 10 mm | 123 00033 |
| screw-in depth extension 750 mm long, tube-Ø 10 mm | 123 00034 |
| screw-in depth extension 1000 mm long, tube-Ø 10 mm | 123 00035 |
| 160-800 mm | |
| screw-in depth extension 485 mm long, tube-Ø 24 mm | 124 00003 |
| screw-in depth extension 1000 mm long, tube-Ø 24 mm | 124 00007 |
| screw-in depth extension CFK 1000 mm long, tube-Ø 24 mm | 123 00601 |
| screw-in depth extension CFK 1500 mm long, tube-Ø 24 mm | 123 00603 |
| screw-in depth extension CFK 2000 mm long, tube-Ø 24 mm | 123 00605 |



screw-in depth extension 250 mm long, tube Ø 5 mm



screw-in measuring depth extension CFK, 1000 mm long, tube Ø 24 mm

RABITO Precision Bore Gauge ^{RA}

FOR MEASURING INTERNAL DIAMETERS,
APPLICATION RANGE 18 - 300 MM

Delivery RA:

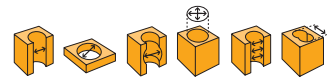
holder, fixed measuring pins in steel, washers, in case, without dial gauge.

RABITO RA

| application range [mm] | Code |
|------------------------|-----------|
| 18 - 35 | 404 00001 |
| 35 - 60 | 405 00001 |
| 50 - 150 | 407 00001 |
| 18 - 150* | 416 00001 |
| 150 - 300 | 410 00001 |

* consists of 2 complete sets in case

SERIES 404-416



RABITO 50-150

SUBITO® Precision Bore Gauge ^{SS/SSV}

FOR MEASURING OF BLIND BORE DIAMETERS

Delivery SS:

holder, measuring slides and contact pin tungsten carbide as standard, in case, without dial gauge. Version with h = 1 mm: for measuring very close of the bottom of the bore.

SUBITO® SS

| application range [mm] | front distance h [mm] | meas. slides carbide Code | meas. slides ruby Code | holder SS Code |
|------------------------|-----------------------|---------------------------|------------------------|----------------|
| 20 - 50 | 1,5 | 140 00000 | 140 00001 | 140 00024 |
| 20 - 60 | 1,5 | 141 00000 | 141 00001 | 141 00024 |
| 50 - 110 | 1,5 | 142 00000 | 142 00001 | 142 00027 |
| 50 - 140 | 1,5 | 143 00000 | 143 00001 | 142 00027 |
| 110 - 300 | 2,0 | 144 00000 | 144 00001 | 144 00032 |
| 110 - 400 | 2,0 | 145 00000 | 145 00001 | 144 00032 |
| 300 - 600 | 2,0 | 145 00100 | 145 00101 | 145 00105 |
| 20 - 50 | 1,0 | 140 00002 | | |
| 20 - 60 | 1,0 | 141 00002 | | |
| 50 - 110 | 1,0 | 142 00002 | | |
| 50 - 140 | 1,0 | 143 00002 | | |
| 110 - 300 | 1,0 | 144 00002 | | |
| 110 - 400 | 1,0 | 145 00002 | | |
| 300 - 600 | 1,0 | 145 00102 | | |

Delivery SSV:

1 short upper part, 2 blind bores measuring heads, measuring slides, in case, without dial gauge.

SUBITO® BLINDE BORES VARIO SSV

| application range [mm] | front distance h [mm] | meas. slide carbide Code | meas. slide ruby Code |
|------------------------|-----------------------|--------------------------|-----------------------|
| 20 - 140 | 1,5 | 146 00000 | 146 00001 |
| 20 - 140 | 1,0 | 146 00002 | |

SERIES 140-146

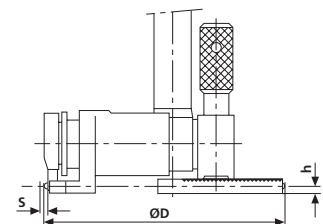


SUBITO® SS for blind bores

s: travel

D: diameter to be measured

h: front distance

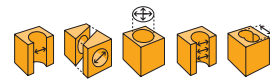


front distance h for SUBITO® SS

SUBITO® Precision Bore Gauge SMT

FOR MEASURING INTERNAL DIAMETERS
IN LARGE DEPTH

SERIES 230-244



Delivery SMT:

as Series SU, but holder in special length; fixed measuring pins and movable contact pin tungsten carbide tipped as standard, coated centering plate, in case or transportation box, without dial gauge.
Larger and intermediate depth on inquiry.

SUBITO® SMT

| application range [mm] | measuring depth [mm] | | | |
|------------------------|----------------------|-----------|-----------|------------|
| | 250 Code | 500 Code | 750 Code | 1.000 Code |
| 4,5 - 6 | 230 00000 | - | - | - |
| 6 - 8 | 231 00000 | 231 00001 | 231 00002 | 231 00003 |
| 8 - 12 | 232 00000 | 232 00001 | 232 00002 | 232 00003 |
| 12 - 20 | 233 00000 | 233 00001 | 233 00002 | 233 00003 |
| 18 - 35 | 234 00000 | 234 00001 | 234 00002 | 234 00003 |
| 35 - 60 | 235 00000 | 235 00001 | 235 00002 | 235 00003 |
| 50 - 100 | 236 00000 | 236 00001 | 236 00002 | 236 00003 |
| 50 - 150 | 237 00000 | 237 00001 | 237 00002 | 237 00003 |
| 100 - 160 | - | 238 00001 | 238 00002 | 238 00003 |
| 100 - 230 | - | 239 00001 | 239 00002 | 239 00003 |
| 160 - 290 | - | 240 00001 | 240 00002 | 240 00003 |
| 160 - 360 | - | 241 00001 | 241 00002 | 241 00003 |
| 280 - 410 | - | 242 00001 | 242 00002 | 242 00003 |
| 280 - 510 | - | 243 00001 | 243 00002 | 243 00003 |



SMT, SU, SK

| application range [mm] | measuring depth [mm] | | | | |
|------------------------|----------------------|------------|------------|------------|------------|
| | 1.250 Code | 1.500 Code | 2.000 Code | 2.500 Code | 3.000 Code |
| 18 - 35 | 234 00004 | - | - | - | - |
| 35 - 60 | 235 00004 | 235 00005 | 235 00006 | 235 00007 | 235 00008 |
| 50 - 100 | 236 00004 | 236 00005 | 236 00006 | 236 00007 | 236 00008 |
| 50 - 150 | 237 00004 | 237 00005 | 237 00006 | 237 00007 | 237 00008 |
| 100 - 160 | 238 00004 | 238 00005 | 238 00006 | 238 00007 | 238 00008 |
| 100 - 230 | 239 00004 | 239 00005 | 239 00006 | 239 00007 | 239 00008 |
| 160 - 290 | 240 00004 | 240 00005 | 240 00006 | 240 00007 | 240 00008 |
| 160 - 360 | 241 00004 | 241 00005 | 241 00006 | 241 00007 | 241 00008 |
| 280 - 410 | 242 00004 | 242 00005 | 242 00006 | 242 00007 | 242 00008 |
| 280 - 510 | 243 00004 | 243 00005 | 243 00006 | 243 00007 | 243 00008 |

SUBITO® Precision Bore Gauge SE

FOR MEASURING DEEP BORES

SERIES 130-133



For the use with an electronic length measuring probe and indicating unit; measuring depths up to 12 m are possible.
A complete instrument consists of: measuring head, connecting tube (1000 mm) with cardan joint, length measuring probe, extensions if necessary. Delivery in transportation box, without length measuring probe, without indicating unit.

SUBITO® SE

| application range [mm] | Code |
|------------------------|--------------|
| 35 - 60 | 130 00000 |
| 50 - 90/(120)* | 131 00000/01 |
| 100 - 230 | 132 00000 |
| > 200 | auf Anfrage |

* measuring range extension up to Ø 120 mm/160 mm on request.

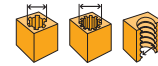


SUBITO® SE for deep bores
up to 12 m depth

SUBITO® Precision Bore Gauge **KT**

FOR MEASURING THE TWO-BALL DIMENSION OF TOOTHINGS

SERIES 160-164



Delivery KT:

holder with contact pin and exchangeable measuring inserts; contact pin and measuring inserts with inside thread to screw in ball inserts; in case, ball inserts to be ordered separately. Measuring gauges for internal gears from diameter > 8 mm based on OSIMESS® on inquiry.

SUBITO® KT

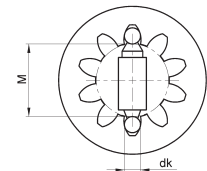
| application range M [mm] | | Code |
|--------------------------|-----------|----------|
| KT 12 | 8 - 12 | 160 0000 |
| KT 22 | 12 - 22 | 161 0000 |
| KT 55 | 22 - 55 | 162 0000 |
| KT 250 | 55 - 250 | 163 0000 |
| KT 510 | 100 - 510 | 164 0000 |



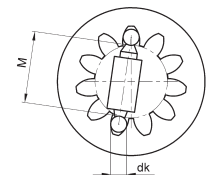
SUBITO® KT with measuring inserts and ball inserts

ACCESSORIES KT

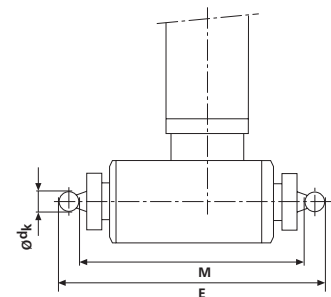
| application range M [mm] | | thread | Code |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| KT 12 | 1 set ball inserts with tungsten carbide balls of your choice*; ball-Ø d over 0,8 up to 2 mm (1 x measuring pin, 1 x ball insert) | M 1,6 | 160 0001 |
| | as above however with intermediate dimension | | 160 00101 |
| KT 22 | 1 set ball inserts with tungsten carbide balls of your choice*; ball-Ø d over 0,8 up to 4 mm | M 1,6 | 161 00001 |
| | as above however with intermediate dimension | | 161 00101 |
| KT 55 | 1 set ball inserts with tungsten carbide balls of your choice*; up to ball-Ø d 7 mm | M 2,5 | 162 00001 |
| | as above however with intermediate dimension | | 162 00101 |
| | 1 set ball inserts with tungsten carbide balls of your choice*; ball-Ø d over 7 up to 10 mm | | 162 00003 |
| | as above however with intermediate dimension | | 162 00103 |
| | reducing socket for the use of ball inserts | M1,6/M2,5 | 162 00032 |
| KT 250/510 | 1 set ball inserts with tungsten carbide balls of your choice*; up to ball-Ø d 7 mm | M 4 | 163 00001 |
| | as above however with intermediate dimension | | 163 00101 |
| | 1 set ball inserts with tungsten carbide balls of your choice*; ball-Ø d over 7 up to 10 mm | M4/M 2,5 | 163 00003 |
| | as above however with intermediate dimension | | 163 00103 |
| | reducing socket for the use of ball inserts | | 162 00004 |
| | KT 55 in KT 250/510 | | |



even number of teeth



odd number of teeth



SUBITO® KT - dimensions

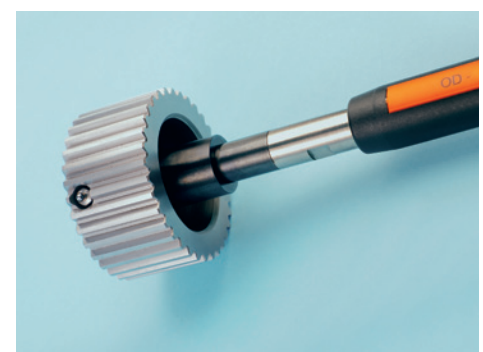
* Ball inserts with standard ball diameter < 10 mm according to our tungsten carbide ball list on page 30.

Ball inserts with tungsten carbide ball diameter < 0,8 mm and > 10 mm on inquiry.

Splined Plug Gauge

FOR MEASURING THE DIAMETRAL TWO-BALL DIMENSION IN THE RANGE M (DISTANCE BETWEEN BALLS) 12 - 100 MM - MEASURING WITHOUT TIPPING OF THE GAUGE.

- fully toothed design.
- plain design with positioning pin. on inquiry



Splined Plug Gauge

SUBITO® Precision Bore Gauge SN

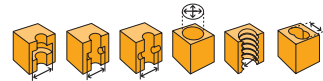
FOR MEASURING GROOVES AND RECESSES

Holder with retraction for measuring recesses with groove width from 3 mm; in case, without dial gauge. Delivery with one measuring pin for the required diameter within the application range.

SUBITO® SN

| application range [mm] | retraction [mm] | Code |
|------------------------|-----------------|-----------|
| 60 - 120 | 8,5 | 165 00000 |
| 120 - 180 | 23 | 166 00000 |
| 180 - 300 | 30 | 167 00000 |

SERIES 165-167



SUBITO® SN for grooves and recesses

SUBITO® Precision Bore Gauge ST

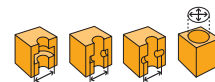
FOR MEASURING PILLOW BLOCK HOUSINGS, INTERNAL GROOVES AND RECESSES

with 180° rotatable fixed measuring pin; in case, without dial gauge.

SUBITO® ST

| application range [mm] | | standard measuring depth | meas. depth 200 [mm] | meas. depth 400 [mm] | meas. depth 750 [mm] |
|------------------------|--------|--------------------------|----------------------|----------------------|----------------------|
| 30 - 52 | ST 52 | 170 00000 | 170 00001 | 170 00002 | 170 00003 |
| 50 - 70 | ST 70 | 171 00000 | 171 00001 | 171 00002 | 171 00003 |
| 60 - 100 | ST 100 | 172 00000 | 172 00001 | 172 00002 | 172 00003 |
| 80 - 150 | ST 150 | 173 00000 | 173 00001 | 173 00002 | 173 00003 |
| 120 - 220 | ST 220 | 174 00000 | - | 174 00002 | 174 00003 |
| 180 - 360 | ST 360 | 175 00000 | - | 175 00002 | 175 00003 |
| 290 - 530 | ST 530 | 176 00000 | - | 176 00002 | 176 00003 |

SERIES 170-176



SUBITO® ST with fixed measuring pin turned in

Precision Bore Gauge ON/ONM

FOR MEASURING GROOVES AND RECESSES

Complete set consists of basic unit and expanding probe ON, ONM (additionally with measuring slides); retraction travel up to 10 mm (standard); up to 20 mm from Ø 40 mm possible; delivery in case, without expanding probe and dial gauge.

expanding probe ON: probe with determined range of application.

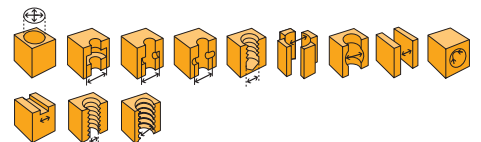
expanding probe ONM: probe with flexible range of application through movable slides, which have to be ordered separately.

BASIC UNIT ON/ONM

| | Code |
|-------------------------------------------------------|-----------|
| holder for expanding probe ON and ONM for Ø 6 - 55 mm | 190 00000 |
| from Ø 20 mm* | 190 00042 |

* with stronger spring

SERIES 190



ON / ONM basic unit with expanding probe ON, ONM and measuring slides

Precision Bore Gauge **ON/ONM**

SERIES 190

FOR MEASURING GROOVES AND RECESSES

EXPANDING PROBE ON

| application range [mm] | Code | blind bore design |
|------------------------|-----------|-------------------|
| 6 - 8 | 190 00001 | |
| 8 - 12 | 190 00002 | |
| 10 - 14 | 190 00003 | |
| 12 - 18 | 190 00004 | |
| 16 - 22 | 190 00005 | |
| special ranges | 190 00035 | |

EXPANDING PROBE ONM

| application range [mm] | travel [mm] | Code standard design | Code blind bore design |
|------------------------|-------------|----------------------|------------------------|
| 20 - 55 | 10 | 190 00006 | 190 00110 |
| 40 - 200 | 10 | 190 00013 | 190 00111 |
| 40 - 200 | 20 | 190 00041 | 190 00112 |

MEASURING SLIDES FOR ONM

| for ONM 20-55 application range [mm] | Code | for ONM 20-55 application range [mm] | Code |
|--------------------------------------|-----------|--------------------------------------|-----------|
| 20 - 30 | 190 00007 | 40 - 50 | 190 00011 |
| 25 - 35 | 190 00008 | 45 - 55 | 190 00012 |
| 30 - 40 | 190 00009 | special range | 190 00036 |
| 35 - 45 | 190 00010 | | |

| for ONM 40-200 application range [mm] | Code | for ONM 40-200 application range [mm] | Code |
|---------------------------------------|-----------|---------------------------------------|-----------|
| 40 - 50 | 190 00014 | 70 - 80 | 190 00020 |
| 45 - 55 | 190 00015 | 75 - 85 | 190 00021 |
| 50 - 60 | 190 00016 | 80 - 90 | 190 00022 |
| 55 - 65 | 190 00017 | 85 - 95 | 190 00023 |
| 60 - 70 | 190 00018 | 90 - 100 | 190 00024 |
| 65 - 75 | 190 00019 | 95 - 105 | 190 00025 |

| | |
|------------------------------------------------|-----------|
| blind bore design - measuring slides surcharge | 190 00900 |
| special ranges from 40 - 100 mm | 190 00038 |
| special ranges from 100 - 200 mm | 190 00039 |
| > 100 up to maximum 200 mm in 5 mm steps | 190 00037 |

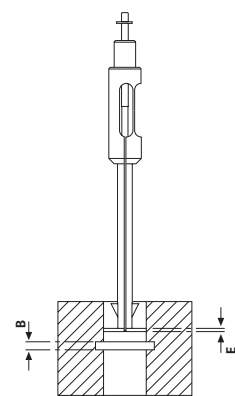
ACCESSORIES / OPTIONS

| | Code |
|------------------------------------------------------------------------|-----------|
| measuring depth extension 100 mm from \varnothing 20 mm | 190 00032 |
| measuring depth extension 250 mm from \varnothing 20 mm | 190 00033 |
| depth stop | 190 00034 |
| expanding probe - hard chrome plated | 190 00901 |
| measuring slide - hard chrome plated | 190 00902 |
| adapting expanding probes / measuring slides to reduced groove width B | 190 00900 |

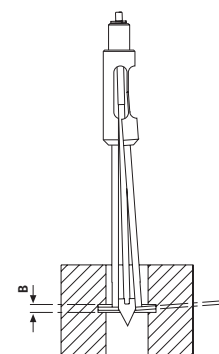
version for grooves $\varnothing < 6$ mm on inquiry



ON/ONM Accessories measuring depth extension, depth stop



insertion



measurement

Groove Measuring Gauge ON-OD **ON-OD**

FOR THE SAFE AND FAST SERIES MEASURING OF GROOVES

Centring diameter of the measuring sleeve OD in the range 20 to 100 mm.
A split probe of the series ON/ONM is integrated in a measuring sleeve OD and ensures an automatic alignment and centring of the measuring axis.
Measuring without tipping of the gauge. Design individually for a specific measuring task; without dial gauge.



Groove Measuring Gauge ON-OD

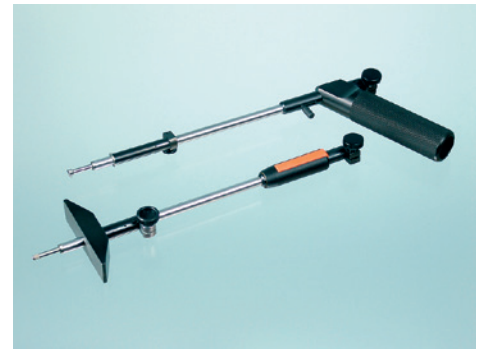
Distance Measuring Gauges **OT**

FOR MEASURING BORE DEPTHS, SHOULDERS,
WIDTHS/DISTANCES OF GROOVES AND RECESSES

SERIES OT

| | meas. depth [mm] | Code |
|-------------------------------------------------------------------------------|------------------|---------------------|
| OT - Standard with 6 mm ball insert M 2,5 and measuring bridge 80 mm, in case | 175/325 | 198 00000/198 00002 |
| OT 4 - complete set with handle, measuring sleeve and probe finger, in case | 175/300 | 199 00000/199 00001 |

SERIES 198-199



OT Depth Measuring Gauge
OT 4 (top) and
OT - standard (bottom)

CITO 3P Precision Measuring Gauge **CI**

FOR MEASURING INTERNAL DIAMETERS

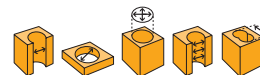
Delivery CI:

holder, measuring pins tungsten carbide, w/o dial gauge
Measuring w/o tipping, no need to search for reversal point on indicator.

CITO 3P

| application range [mm] | Code |
|------------------------|-----------|
| 12 - 20 | 121 00005 |
| 20 - 35 | 121 00000 |
| 35 - 55 | 121 00001 |
| 50 - 80 | 121 00002 |
| 80 - 120 | 121 00003 |
| 120 - 170 | 121 00004 |

SERIES 121



CITO 3P

SUBITO® Setting Device ESU

SERIES 125

FOR SETTING TWO-POINT COMPARATOR PRECISION BORE GAUGES WITH THE HELP OF GAUGE BLOCKS

Delivery ESU:

frame with setting jaws holder, pair of setting jaws, tungsten carbide measuring anvils in gauge block quality, clamping unit, in box; without gauge blocks

FOR SUBITO® SU/SK/SW/SMT/SP/SV

| setting range [mm] | Code |
|--------------------|-----------|
| 4,5 - 35 | 125 0000 |
| 4,5 - 160 | 125 0001 |
| 4,5 - 290 | 125 00029 |
| 18 - 160 | 125 00028 |
| 18 - 290 | 125 00002 |
| 160 - 510 | 125 00003 |
| 160 - 800 | 125 00030 |
| 160 - 1.200 | 125 00043 |
| 160 - 1.500 | 125 00045 |
| 160 - 2.000 | 125 00046 |

models for bore gauges of other brands on inquiry

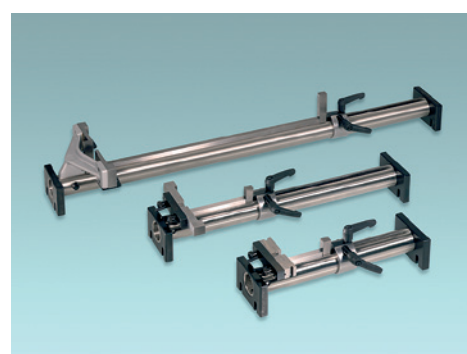
| for series | setting range [mm] | Code |
|------------|--------------------|-----------|
| SS | 20 - 300 | 125 00005 |
| SS | 20 - 600 | 125 00038 |
| ST | 30 - 220 | 125 00006 |
| ST | 180 - 530 | 125 00007 |
| OD-K/OD-KK | 130 - 300 | 125 00034 |
| OD-K/OD-KK | 130 - 500 | 125 00035 |

SPARE PARTS

| setting range [mm] | Code |
|---------------------------------------------------------------------------------------------|------------------------------------------|
| setting jaws holder with spreading lever (suitable for all setting jaw pairs, except SP) | 125 00008 |
| Pair of setting jaw with stay bolt and nut | |
| 4,5 - 35 | 125 00009 |
| 18 - 290 | 125 00011 |
| 20 - 300 | for SS 125 00012 |
| 30 - 220 | for ST 125 00013 |
| 6 - 160 | with setting jaw holder for SP 125 00014 |
| prism pair for OD cross sleeve / cross sleeve with runners | 125 00033 |
| pair of tungsten carbide measuring anvils for ESU 4,5 - 300 | 125 00015 |
| pair of tungsten carbide measuring anvils for ESU 160 - 800 | 125 00036 |
| stand for vertical use for ESU 4,5-290 | 125 00018 |
| stand for vertical use for ESU 160-800 | 125 10052 |



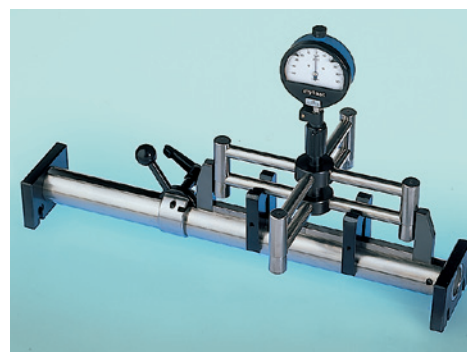
ESU Setting Device with vertical measuring axis



ESU Setting Device 510/290/160 with horizontal measuring axis



ESU accessories setting jaws/ measuring anvil



ESU Setting Device for OD cross sleeves/ cross sleeve with runners

MEASURING TAPES FOR MEASURING OUTSIDE CIRCUMFERENCE AND DIAMETER OF CYLINDRICAL PARTS



CIRCOMETER® CJU

Circumference tape for measuring the outside circumference and diameter; graduation distance 1 mm, scaling according to DIN 866; with vernier 0,1 mm, laserscaled. Tape width: 16 mm.



Circometer® CJU

CIRCOMETER® CJU

| circumference range [mm] | diameter range [mm] | type | Code steel | Code stainless steel | Code black | stainless steel width 35 mm | |
|--------------------------|---------------------|------------|------------|----------------------|------------|-----------------------------|--|
| 60 - 950 | 20 - 300 | 950 | 620 00001 | 620 00027 | 620 00200 | 620 00915 | |
| 940 - 2200 | 300 - 700 | 2200 | 620 00002 | 620 00028 | 620 00201 | 620 00918 | |
| 2190 - 3460 | 700 - 1100 | 3460 | 620 00003 | 620 00029 | 620 00202 | 620 00928 | |
| 3450 - 4720 | 1100 - 1500 | 4720 | 620 00004 | 620 00030 | 620 00203 | 620 00936 | |
| 4710 - 5980 | 1500 - 1900 | 5980 | 620 00005 | 620 00031 | 620 00204 | 620 00911 | |
| 5970 - 7230 | 1900 - 2300 | 7230 | 620 00006 | 620 00032 | 620 00205 | 620 00912 | |
| 7220 - 8500 | 2300 - 2700 | 8500 | 620 00007 | 620 00033 | 620 00206 | 620 00916 | |
| 8490 - 9760 | 2700 - 3100 | 9760 | 620 00008 | 620 00034 | 620 00207 | 620 00950 | |
| 9730 - 11010 | 3100 - 3500 | 11010 | 620 00009 | 620 00035 | 620 00208 | 620 00951 | |
| - 23550 | - 7500 | on inquiry | | | | | |

further band widths (6/60 mm), INCH design and with special reading 0,05 mm in diameter on inquiry

C-TAPE

C-measuring tape for determining the outside diameter; graduation distance 1 mm, with vernier 0,05 mm, laserscaled. Tape width: 12 mm. Standard design: out of stainless steel

Black coated design: for maximum reading contrast



top: C-tape black
C-tape with vernier 0,05

C-TAPE

| measuring range [mm] | type | Code stainless steel | Code black |
|----------------------|-------|----------------------|------------|
| 15 - 115 | C 115 | 621 00063 | 621 00110 |
| 100 - 230 | C 230 | 621 00064 | 621 00111 |
| 200 - 330 | C 330 | 621 00065 | 621 00112 |
| 300 - 620 | C 620 | 621 00073 | 621 00116 |



Precision steel rulers

FOR FAST AND ACCURATE LENGTH-MEASURING

Steel rulers are made of stainless steel. Wide design with double laser marked scaling, in mm. Mat surface for better reading. High precision, width 30 mm.

PRECISION STEEL RULERS

| measuring range [mm] | deviation [mm] | Code |
|----------------------|----------------|-----------|
| 150 | ±0,1 | 620 00849 |
| 300 | ±0,1 | 620 00842 |
| 500 | ±0,1 | 620 00843 |
| 1000 | ±0,15 | 620 00844 |
| 2000 | ±0,2 | 620 00845 |

different measuring ranges and scalings, e.g. in INCH, on inquiry



precision steel rulers

Measuring Tapes **CJL/IUB/NO**

FOR MEASURING PLANE-PARALLEL DISTANCES AND FOR INSIDE CIRCUMFERENCE AND DIAMETER OF CYLINDRICAL PARTS

SERIES 622-624



MEASURING TAPE CJL

Length measuring tape CJL for measuring plane-parallel distances graduation distance 1 mm; with vernier 0,1 mm; laserscaled, stainless steel. Tape width: 16 mm.

MEASURING TAPE CJL

| type | measuring range distance [mm] | Code |
|----------|-------------------------------|-----------|
| CJL 950 | 60 - 950 | 622 00076 |
| CJL 2200 | 900 - 2200 | 622 00077 |
| CJL 3460 | 2200 - 3460 | 622 00078 |
| CJL 4780 | 3400 - 4780 | 622 00079 |
| CJL 6000 | 4700 - 6000 | 622 00080 |

larger measuring ranges on inquiry



length measuring tape CJL

INSIDE CIRCUMFERENCE TAPE IUB

Measuring tape for determining the inside circumference and average diameter of round, oval or constant polygonal bores. Graduation distance 1 mm with vernier 0,1 mm. Laserscaled, stainless steel; The tape is put against the inside bore wall with the help of clamping nippers. Tape width: 20 mm

CIRCUMFERENCE TAPE IUB

| circumference range [mm] | diameter range [mm] | type | Code |
|------------------------------------------------------------------|---------------------|----------|-----------|
| clamping nippers for IUB (needed only once); for all tape ranges | | | 623 00016 |
| 720 - 1550 | 230 - 490 | IUB 1550 | 623 00012 |
| 940 - 2200 | 300 - 700 | IUB 2200 | 623 00013 |
| 2190 - 3460 | 700 - 1100 | IUB 3460 | 623 00014 |
| 3450 - 4720 | 1100 - 1500 | IUB 4720 | 623 00015 |
| 4710 - 5980 | 1500 - 1900 | IUB 5980 | 623 00071 |
| 5970 - 7230 | 1900 - 2300 | IUB 7230 | 623 00086 |
| 7220 - 8500 | 2300 - 2700 | IUB 8500 | 623 00087 |

larger measuring ranges on inquiry



inside circumference tape IUB

NOVOMETER

Contour measuring gauge for determining the average inside diameter of round, oval or constant polygonal bores, with scaled ring and vernier. Tape width: 20 mm

Digital Novometer: with resolution 0,01 mm; recording of measuring values through interface RS 232 or RS 485 also for SPC-Systems; digital display for Ø or circumference.

Novometer for outside diameter NOA: with reading 0,1 mm.

CONTOUR GAUGE NOVOMETER

| diameter range [mm] | reading [mm] | Code | Code digital | NOA |
|-------------------------------------------------------------------------------------------|--------------|------------|--------------|-----------|
| 14 - 24 | 0,1 | 624 00017 | 624 00088 | - |
| 22 - 40 | 0,1 | 624 00018 | 624 00089 | 624 00230 |
| 35 - 60 | 0,1 | 624 00019 | 624 00090 | 624 00231 |
| 55 - 100 | 0,1 | 624 00020 | 624 00091 | 624 00232 |
| 95 - 180 | 0,1 | 624 00021 | 624 00092 | 624 00233 |
| 170 - 255 | 0,1 | 624 00022 | 624 00211 | 624 00034 |
| 245 - 330 | 0,1 | 624 00070 | 624 00212 | 624 00235 |
| spare tape for Novometer | 0,1 | on inquiry | | |
| Option: sliding clutch for reproducible measuring force with elastic work pieces 35 - 330 | | 624 00102 | | |
| Option: PTFE-coating of the tape to reduce the friction on inquiry | | | | |
| Option: Table device on inquiry | | | | |



contour gauge NOVOMETER

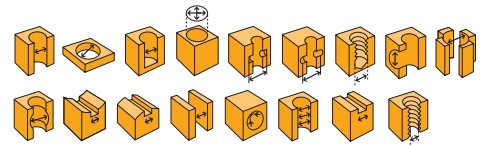


digital NOVOMETER

OSIMESS® Precision Bore Gauge OS/OSH/OSS

FOR SMALL DIAMETERS 1,0 - 20 MM

SERIES 625-628



STANDARD DESIGN OS COMPLETE SETS

Delivery OS:

hardchromed design from 4,5 mm; tungsten carbide tipped for 1-4 mm, wedge-shaped measuring needle generally tungsten carbide; holder of your choice, in case, without setting rings, without dial gauge. separate probes see pages 19 and 20.

DESIGN OSH COMPLETE SETS

as described for OS, but with tungsten carbide tipped probes

DESIGN OSS COMPLETE SETS

as described for OS, but with probes for blind bores from Ø 1,75 mm



OSIMESS® - various probes

| OSIMESS® | | OS | | OSH | | OSS | |
|------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|
| | | holder without retraction | holder with retraction | holder without retraction | holder with retraction | holder without retraction | holder with retraction |
| application range [mm] | number of probes | | | | | | |
| <i>nominal range</i> | <i>effective range</i> | | | | | | |
| 1,00 - 1,40 | 0,95 - 1,55 | 5 | - | - | 626 00200 | 626 00201 | - |
| 1,75 - 4,00 | 1,50 - 4,20 | 10 | - | - | 626 00202 | 626 00203 | 626 00003 |
| 1,00 - 4,00 | 0,95 - 4,20 | 15 | - | - | 626 00000 | 626 00001 | - |
| 4,50 - 7,50 | 4,15 - 7,80 | 7 | 627 00200 | 627 00201 | 627 00202 | 627 00203 | on inquiry |
| 8,00 - 12,00 | 7,70 - 12,50 | 6 | 627 00300 | 627 00301 | 627 00302 | 627 00303 | 627 00304 |
| 4,50 - 12,00 | 4,15 - 12,50 | 13 | 627 00000 | 627 00001 | 627 00004 | 627 00005 | 627 00003 |
| 13,00 - 20,00 | 12,20 - 20,60 | 8 | 628 00000 | 628 00001 | 628 00004 | 628 00005 | 628 00003 |

OSIMESS® Precision Bore Gauge OS

SERIES 625-628

HOLDER

Holder with retraction especially recommended for probes up to 4 mm, for blind bore probes and for the maximum protection of the probes.

HOLDER

| design | Code |
|---------------------------------------------|-----------|
| holder without retraction for 1,0 - 20,0 mm | 625 00009 |
| holder with retraction for 1,0 - 20,0 mm | 626 00010 |

ACCESSORIES

| | measuring range [mm] | Code |
|----------------------------------------|----------------------|-----------|
| clamp with depth stop | 1,0 - 4,0 | 626 00005 |
| | 4,5 - 9,0 | 627 00007 |
| | 10,0 - 20,0 | 628 00007 |
| angle piece 90° | 1,0 - 20,0 | 625 00008 |
| measuring depth extension from Ø 10 mm | 50 mm long | 625 00101 |
| | 100 mm long | 626 00102 |
| | 250 mm long | 627 00103 |

OS-probe with special length for Ø < 10 mm on inquiry



angle piece 90° with OSIMESS®-holder

OSIMESS® Measuring Needles

MEASURING NEEDLES

| measuring needles | Code |
|------------------------|-----------|
| 1,0 - 1,4 OS-OSH | 626 00067 |
| 1,75 - 2,25 OS-OSH-OSS | 626 00068 |
| 2,5 - 4,0 OS-OSH-OSS | 626 00069 |
| 4,5 - 9 mm OS - OSH | 627 00095 |
| 4,5 - 9 mm OSS | 627 00096 |
| 10 - 20 mm OS - OSH | 628 00055 |
| 10 - 20 mm OSS | 628 00056 |



OSIMESS® probe
blind bore design OSS (top)
OSIMESS® probe
standard design OS (bottom)



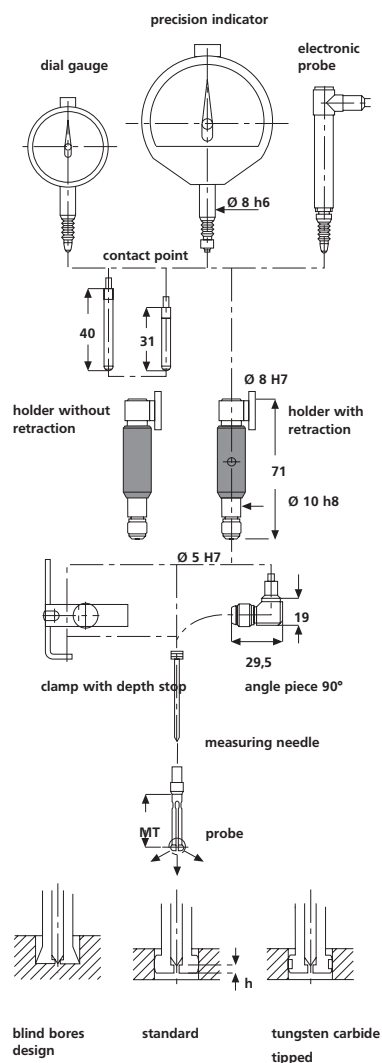
OSIMESS® in case

| setting rings set |
|-------------------|
| 626 00204 |
| 626 00205 |
| 626 00004 |
| 627 00205 |
| 627 00305 |
| 627 00006 |
| 628 00006 |

OSIMESS®-Spare Parts

PROBES 1,0 - 4,0 MM

| nominal dimension [mm] | measuring range [mm] | probe OSH Code | probe OSS Code | setting ring Code |
|------------------------|----------------------|----------------|----------------|-------------------|
| 1,0 | 0,95 - 1,15 | 626 00012 | - | 626 00052 |
| 1,1 | 1,07 - 1,25 | 626 00013 | - | 626 00053 |
| 1,2 | 1,17 - 1,35 | 626 00014 | - | 626 00054 |
| 1,3 | 1,27 - 1,45 | 626 00015 | - | 626 00055 |
| 1,4 | 1,37 - 1,55 | 626 00016 | - | 626 00056 |
| 1,75 | 1,50 - 1,90 | 626 00017 | 626 00042 | 626 00057 |
| 2,0 | 1,80 - 2,20 | 626 00018 | 626 00043 | 626 00058 |
| 2,25 | 2,05 - 2,45 | 626 00019 | 626 00044 | 626 00059 |
| 2,5 | 2,30 - 2,70 | 626 00020 | 626 00045 | 626 00060 |
| 2,75 | 2,55 - 2,95 | 626 00021 | 626 00046 | 626 00061 |
| 3,0 | 2,80 - 3,20 | 626 00022 | 626 00047 | 626 00062 |
| 3,25 | 3,05 - 3,45 | 626 00023 | 626 00048 | 626 00063 |
| 3,5 | 3,30 - 3,70 | 626 00024 | 626 00049 | 626 00064 |
| 3,75 | 3,55 - 3,95 | 626 00025 | 626 00050 | 626 00065 |
| 4,0 | 3,80 - 4,20 | 626 00026 | 626 00051 | 626 00066 |



PROBES 4,5-9,0 MM

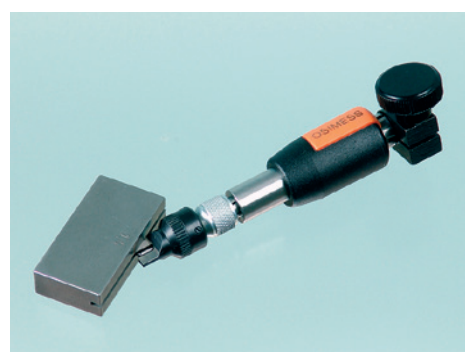
| nominal dimension [mm] | measuring range [mm] | probe OS Code | probe OSH Code | probe OSS Code | setting ring Code |
|------------------------|----------------------|---------------|----------------|----------------|-------------------|
| 4,5 | 4,15 - 4,80 | 627 00015 | 627 00063 | 627 00047 | 627 00079 |
| 5,0 | 4,70 - 5,30 | 627 00016 | 627 00064 | 627 00048 | 627 00080 |
| 5,5 | 5,20 - 5,80 | 627 00017 | 627 00065 | 627 00049 | 627 00081 |
| 6,0 | 5,70 - 6,30 | 627 00018 | 627 00066 | 627 00050 | 627 00082 |
| 6,5 | 6,20 - 6,80 | 627 00019 | 627 00067 | 627 00051 | 627 00083 |
| 7,0 | 6,70 - 7,30 | 627 00020 | 627 00068 | 627 00052 | 627 00084 |
| 7,5 | 7,20 - 7,80 | 627 00021 | 627 00069 | 627 00053 | 627 00085 |
| 8,0 | 7,70 - 8,30 | 627 00022 | 627 00070 | 627 00054 | 627 00086 |
| 8,5 | 8,20 - 8,80 | 627 00023 | 627 00071 | 627 00055 | 627 00087 |
| 9,0 | 8,70 - 9,30 | 627 00024 | 627 00072 | 627 00056 | 627 00088 |



OSIMESS® standard probe OS

PROBES 10,0-20,0 MM

| nominal dimension [mm] | measuring range [mm] | probe OS Code | probe OSH Code | probe OSS Code | setting ring Code |
|------------------------|-------------------------------------|---------------|----------------|----------------|-------------------|
| 10 | 9,2 - 10,5 | 627 00106 | 627 00112 | 627 00109 | 627 00090 |
| 11 | 10,2 - 11,5 | 627 00107 | 627 00113 | 627 00110 | 627 00092 |
| 12 | 11,2 - 12,5 | 627 00108 | 627 00114 | 627 00111 | 627 00094 |
| 13 | 12,2 - 13,5 | 628 00015 | 628 00039 | 628 00031 | 628 00047 |
| 14 | 13,4 - 14,7 | 628 00016 | 628 00040 | 628 00032 | 628 00048 |
| 15 | 14,4 - 15,7 | 628 00017 | 628 00041 | 628 00033 | 628 00049 |
| 16 | 15,4 - 16,7 | 628 00018 | 628 00042 | 628 00034 | 628 00050 |
| 17 | 16,4 - 17,7 | 628 00019 | 628 00043 | 628 00035 | 628 00051 |
| 18 | 17,4 - 18,7 | 628 00020 | 628 00044 | 628 00036 | 628 00052 |
| 19 | 18,4 - 19,7 | 628 00021 | 628 00045 | 628 00037 | 628 00053 |
| 20 | 19,4 - 20,7 | 628 00022 | 628 00046 | 628 00038 | 628 00054 |
| > 20 - 40 | standard and blind bores on inquiry | | | | |



OSF special probe for keyway

SPECIAL PROBES OSF FOR MEASURING GROOVES AND RECESSES

Examples OSF:

- OSF for plane-parallel distances, e.g. keyways
- OSR convex for radial grooves, OSR concave for woodruff keys
- OSB for axial or special grooves

Please let us know the exact nominal dimension with tolerance with your order.

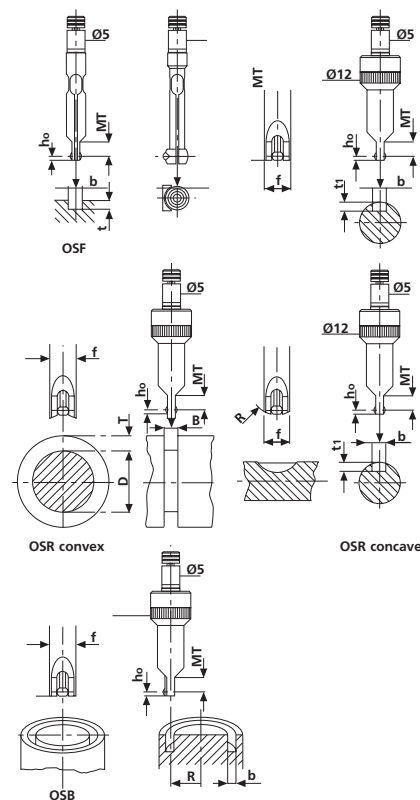
For OSR and OSB please indicate additionally the radius. Example:

special probe OSF No. 626 00035 3,0 H7

probe OSF No. 626 00035 3,0 + 0,15 - 0,01

OSIMESS® OSF

| special probe OSF with nominal dimension [mm] between | probe Code | measuring needle Code |
|-------------------------------------------------------|------------|-----------------------|
| 1,0 - 1,4 | 626 00027 | 626 00067 |
| 1,75 - 2,25 | 626 00032 | 626 00068 |
| 2,5 - 4,0 | 626 00035 | 626 00069 |
| 4,5 - 9,0 | 627 00031 | 627 00105 |
| 10,0 - 20,0 | 627 00042 | 628 00064 |



special probes OSIMESS® OSF

Measuring Stand OSM **OSM 5/OSM 6**

SERIES 629

FOR THE SERIES CONTROL OF SMALL WORKPIECES

MEASURING STAND OSM 5

Height continuously adjustable up to 250 mm, max. working stroke 90 mm. With depth measuring device and clamping device for second indicating unit. Can also be used in combination with SUBITO® or plug gauges OD or similar bore gauges as well as for depth and thickness measurements (as an option). delivery without dial gauge

MEASURING STAND OSM 5 HG HARD STONE

as OSM 5 standard, however the table is out of hard stone. High wear resistance and corrosion-resistant.

MEASURING STAND OSM 6

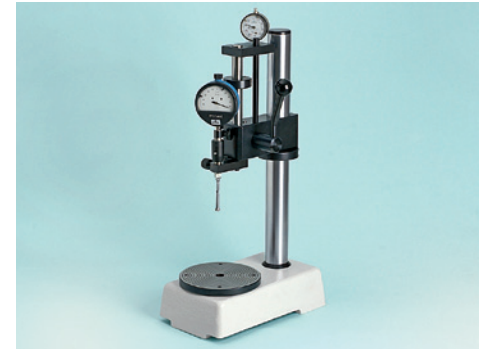
Height continuously adjustable up to 130 mm. Working stroke of the table max. 40 mm, suitable for workpieces up to Ø 144 mm.

MEASURING STAND

| model | Code |
|----------|-----------|
| OSM 5 | 629 00015 |
| OSM 5 HG | 629 00000 |
| OSM 6 | 629 00016 |

ACCESSORIES OSM 5

| designation | Code |
|------------------------------------------------------------------------------------------------------------------|-----------|
| floating workpiece support for self-alignment of small workpieces | 629 00001 |
| floating gauge block holder to ease the exact setting with gauge blocks from 1 - 20 mm | 629 00002 |
| floating holder with clamping shaft, for integrating the OSIMESS® holder or OD holder or for the use in fixtures | 629 00003 |
| measuring travel limitation for OSIMESS® holder with retraction | 629 00011 |



measuring stand OSM 5 with OSIMESS probe



measuring stand OSM 6



floating holder

Setting Rings

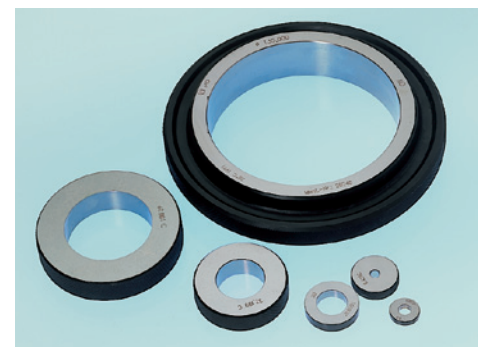
ACCORDING TO DIN 2250

Ideal for setting of OD plug gauges and of SUBITO® measuring gauges. Setting rings made of hardened 62 HRC steel, according to DIN 2250. Tolerance of diameter is JS4. The rings are marked with their actual size (up to 1 µm).

SETTING RINGS

| | Code |
|----------------------------------------------------|------------|
| setting rings Ø 1-20 mm see series 625-628 OSIMESS | |
| setting rings type C Ø 1 - 300 | |
| setting rings type B - for pneumatic plug gauges | on inquiry |
| setting rings for tapers | |
| setting rings for toothings | |
| setting rings more accurate than JS4 | |

SERIES 129

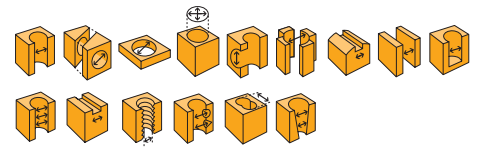


setting rings according to DIN 2250

Indicating Plug Gauge OD

FOR MEASURING INTERNAL DIAMETERS,
APPLICATION RANGE 2,0 - 800 MM

SERIES 300-326



Assembly complete set:

Measuring sleeve with two radially movable contact pins, offset by 180° +
OD holder (see page 24) + indication unit of choice. Standard measuring range
s: 0,2 mm for $\varnothing \geq 6$ mm. Standard design of the measuring sleeve: hardened steel,
alternatively hard chromed, measuring contacts tungsten carbide.

Please let us know the exact bore tolerance with your order:

Example: measuring sleeve OD No. 304 00000 35 H7
measuring sleeve OD No. 304 00000 35 + 0,15/-0,01
measuring sleeve OD No. 304 00000 34,990/35,005

* nominal \varnothing 6,1 - 9 mm: h = 6 mm; nominal \varnothing 9,1 - 12 mm: h = 10 mm

OD MEASURING SLEEVES - IN HARDENED STEEL DESIGN

| nominal- \varnothing [mm] | H = STANDARD | | | | | DESIGN OF THE MEASURING CONTACTS IN | | | |
|--------------------------------|--------------|-----------------|---------------------|--------------|-----------------|-------------------------------------|-----------------|---------------------|--|
| | h [mm] | carbide Code | hardchromed Code | ruby Code | diamond Code | FOR THROUGH BORES | | | |
| | | | | | | h [mm] | carbide Code | hardchromed Code | |
| 2,0 - 2,5 | 1 | 300 00015 | | | | - | | | |
| 2,6 - 6,0 | 1,5 | 300 00000 | | 300 00003 | | 6 | 300 00002 | | |
| 6,1 - 12,0 | 2,5 | 301 00000 | 301 00010 | 301 00003 | 301 00025 | 6/10* | 301 00002 | 301 00026 | |
| 12,1 - 20,0 | 2,5 | 302 00000 | 302 00007 | 302 00003 | 302 00017 | 10 | 302 00002 | 302 00018 | |
| 20,1 - 30,0 | 3,5 | 303 00000 | 303 00007 | 303 00003 | 303 00022 | 10 | 303 00002 | 303 00023 | |
| 30,1 - 40,0 | 3,5 | 304 00000 | 304 00006 | 304 00003 | 304 00029 | 10 | 304 00002 | 304 00030 | |
| 40,1 - 60,0 | 3,5 | 305 00000 | 305 00006 | 305 00003 | 305 00020 | 10 | 305 00002 | 305 00021 | |
| 60,1 - 80,0 | 4,0 | 306 00000 | 306 00006 | 306 00003 | 306 00022 | 10 | 306 00002 | 306 00023 | |
| 80,1 - 100,0 | 4,0 | 307 00000 | 307 00006 | 307 00003 | 307 00016 | 10 | 307 00002 | 307 00017 | |
| 100,1 - 110,0 | 4,0 | 308 00000 | 308 00021 | 308 00022 | 308 00023 | 10 | 308 00002 | 308 00024 | |
| 110,1 - 120,0 | 4,0 | 309 00010 | 309 00006 | 309 00007 | 309 00008 | 10 | 309 00012 | 309 00009 | |
| 120,1 - 130,0 | 4,0 | 310 00010 | 310 00006 | 310 00007 | 310 00008 | 10 | 310 00012 | 310 00009 | |
| 130,1 - 140,0 | 4,0 | 311 00500 | 311 00503 | 311 00504 | 311 00505 | 10 | 311 00502 | 311 00506 | |
| 140,1 - 150,0 | 4,0 | 312 00500 | 312 00503 | 312 00504 | 312 00505 | 10 | 312 00502 | 312 00506 | |
| 150,1 - 160,0 | 4,0 | 313 00500 | 313 00503 | 313 00504 | 313 00505 | 10 | 313 00502 | 313 00506 | |
| 160,1 - 170,0 | 4,0 | 314 00500 | 314 00503 | 314 00504 | 314 00505 | 10 | 314 00502 | 314 00506 | |
| 170,1 - 180,0 | 4,0 | 315 00500 | 315 00503 | 315 00504 | 315 00505 | 10 | 315 00502 | 315 00506 | |
| 180,1 - 190,0 | 4,0 | 316 00500 | 316 00503 | 316 00504 | 316 00505 | 10 | 316 00502 | 316 00506 | |
| 190,1 - 200,0 | 4,0 | 317 00500 | 317 00503 | 317 00504 | 317 00505 | 10 | 317 00502 | 317 00506 | |

OD MEASURING SLEEVES - HARDCHROMED

| nominal- \varnothing [mm] | H = STANDARD | | | | | DESIGN OF THE MEASURING CONTACTS IN | | | |
|--------------------------------|--------------|-----------------|---------------------|--------------|-----------------|-------------------------------------|-----------------|---------------------|--|
| | h [mm] | carbide Code | hardchromed Code | ruby Code | diamond Code | FOR THROUGH BORES | | | |
| | | | | | | h [mm] | carbide Code | hardchromed Code | |
| 2,0 - 2,5 | 1 | 300 00019 | - | | - | - | | - | |
| 2,6 - 6,0 | 1,5 | 300 00004 | | 300 00034 | | 6 | 300 00009 | | |
| 6,1 - 12,0 | 2,5 | 301 00004 | 301 00032 | 301 00033 | 301 00034 | 6/10* | 301 00009 | 301 00035 | |
| 12,1 - 20,0 | 2,5 | 302 00004 | 302 00024 | 302 00025 | 302 00026 | 10 | 302 00009 | 302 00027 | |
| 20,1 - 30,0 | 3,5 | 303 00004 | 303 00029 | 303 00030 | 303 00031 | 10 | 303 00009 | 303 00032 | |
| 30,1 - 40,0 | 3,5 | 304 00004 | 304 00036 | 304 00037 | 304 00038 | 10 | 304 00009 | 304 00039 | |
| 40,1 - 60,0 | 3,5 | 305 00004 | 305 00027 | 305 00028 | 305 00029 | 10 | 305 00010 | 305 00030 | |
| 60,1 - 80,0 | 4,0 | 306 00004 | 306 00029 | 306 00030 | 306 00031 | 10 | 306 00015 | 306 00032 | |
| 80,1 - 100,0 | 4,0 | 307 00004 | 307 00023 | 307 00024 | 307 00025 | 10 | 307 00011 | 307 00026 | |
| 100,1 - 110,0 | 4,0 | 308 00004 | 308 00030 | 308 00031 | 308 00032 | 10 | 308 00016 | 308 00033 | |
| 110,1 - 120,0 | 4,0 | 309 00004 | 309 00022 | 309 00023 | 309 00024 | 10 | 309 00016 | 309 00025 | |
| 120,1 - 130,0 | 4,0 | 310 00004 | 310 00022 | 310 00023 | 310 00024 | 10 | 310 00025 | 310 00026 | |
| 130,1 - 140,0 | 4,0 | 311 00512 | 311 00513 | 311 00514 | 311 00515 | 10 | 311 00516 | 311 00517 | |
| 140,1 - 150,0 | 4,0 | 312 00512 | 312 00513 | 312 00514 | 312 00515 | 10 | 312 00516 | 312 00517 | |
| 150,1 - 160,0 | 4,0 | 313 00512 | 313 00513 | 313 00514 | 313 00515 | 10 | 313 00516 | 313 00517 | |
| 160,1 - 170,0 | 4,0 | 314 00512 | 314 00513 | 314 00514 | 314 00515 | 10 | 314 00516 | 314 00517 | |
| 170,1 - 180,0 | 4,0 | 315 00512 | 315 00513 | 315 00514 | 315 00515 | 10 | 315 00516 | 315 00517 | |
| 180,1 - 190,0 | 4,0 | 316 00512 | 316 00513 | 316 00514 | 316 00515 | 10 | 316 00516 | 316 00517 | |
| 190,1 - 200,0 | 4,0 | 317 00512 | 317 00513 | 317 00514 | 317 00515 | 10 | 317 00516 | 317 00517 | |

SURCHARGE

| design | Ø-range | Code |
|------------------------------------------------------------------|----------------|-----------|
| surcharge 3-point-design | 4,0 - 8,0 | 319 00509 |
| | 8,1 - 40,0 | 319 00502 |
| | 40,1 - 60,0 | 319 00538 |
| | 60,1 - 100,0 | 319 00510 |
| surcharge extended measuring travel 0,4 mm | 2,5 - 6,0 | 319 00512 |
| surcharge extended measuring travel 0,6 mm | 6,1 - 20,0 | 319 00539 |
| surcharge extended measuring travel 0,6 mm | > 20,1 | 319 00540 |
| surcharge reduced undersize for tolerance <10 µ | 2,5 - 20,0 | 319 00506 |
| surcharge reduced undersize for tolerance <10 µ | > 20,1 - 100,0 | 319 00504 |
| surcharge protection cover (not available for blind bore design) | > 4,0 - 20,0 | 319 00507 |
| | > 20,1 | 319 00508 |

Note: These special versions are not available in every combination!
 measuring contacts hard chromed and diamond are available from Ø 8 mm;
 ruby measuring contacts from Ø 3 mm



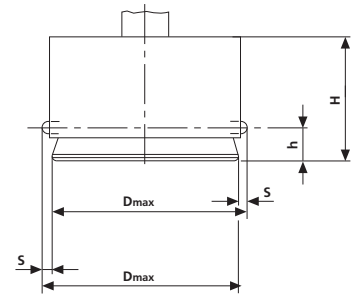
plug gauges OD for various bore diameters

| FOR BLIND BORES | | | | | |
|-----------------|--------------|--------|--------------|------------------|-----------|
| ruby Code | diamond Code | h [mm] | carbide Code | hardchromed Code | ruby Code |
| | | 0,7 | 300 00016 | | |
| 300 00026 | | 1 | 300 00001 | | 300 00028 |
| 301 00027 | 301 00028 | 1 | 301 00001 | 301 00029 | 301 00030 |
| 302 00019 | 302 00020 | 1 | 302 00001 | 302 00021 | 302 00022 |
| 303 00024 | 303 00025 | 1,2 | 303 00001 | 303 00026 | 303 00027 |
| 304 00031 | 304 00032 | 1,2 | 304 00001 | 304 00033 | 304 00034 |
| 305 00022 | 305 00023 | 1,2 | 305 00001 | 305 00024 | 305 00025 |
| 306 00024 | 306 00025 | 1,2 | 306 00001 | 306 00026 | 306 00027 |
| 307 00018 | 307 00019 | 1,2 | 307 00001 | 307 00020 | 307 00021 |
| 308 00025 | 308 00026 | 1,2 | 308 00001 | 308 00027 | 308 00028 |
| 309 00017 | 309 00018 | 1,2 | 309 00011 | 309 00019 | 309 00020 |
| 310 00017 | 310 00018 | 1,2 | 310 00011 | 310 00019 | 310 00020 |
| 311 00507 | 311 00508 | 1,2 | 311 00501 | 311 00509 | 311 00510 |
| 312 00507 | 312 00508 | 1,2 | 312 00501 | 312 00509 | 312 00510 |
| 313 00507 | 313 00508 | 1,2 | 313 00501 | 313 00509 | 313 00510 |
| 314 00507 | 314 00508 | 1,2 | 314 00501 | 314 00509 | 314 00510 |
| 315 00507 | 315 00508 | 1,2 | 315 00501 | 315 00509 | 315 00510 |
| 316 00507 | 316 00508 | 1,2 | 316 00501 | 316 00509 | 316 00510 |
| 317 00507 | 317 00508 | 1,2 | 317 00501 | 317 00509 | 317 00510 |

| FOR BLIND BORES | | | | | |
|-----------------|--------------|--------|--------------|------------------|-----------|
| ruby Code | diamond Code | h [mm] | carbide Code | hardchromed Code | ruby Code |
| | | 0,7 | 300 00020 | - | |
| 300 00032 | - | 1 | 300 00008 | - | 300 00037 |
| 301 00036 | 301 00037 | 1 | 301 00008 | 301 00038 | 301 00039 |
| 302 00028 | 302 00029 | 1 | 302 00008 | 302 00030 | 302 00013 |
| 303 00033 | 303 00034 | 1,2 | 303 00008 | 303 00035 | 303 00036 |
| 304 00040 | 304 00041 | 1,2 | 304 00008 | 304 00042 | 304 00043 |
| 305 00031 | 305 00032 | 1,2 | 305 00009 | 305 00033 | 305 00034 |
| 306 00033 | 306 00034 | 1,2 | 306 00009 | 306 00035 | 306 00037 |
| 307 00027 | 307 00028 | 1,2 | 307 00010 | 307 00029 | 307 00030 |
| 308 00034 | 308 00035 | 1,2 | 308 00005 | 308 00036 | 308 00037 |
| 309 00026 | 309 00027 | 1,2 | 309 00005 | 309 00028 | 309 00029 |
| 310 00027 | 310 00028 | 1,2 | 310 00005 | 310 00029 | 310 00030 |
| 311 00518 | 311 00519 | 1,2 | 311 00520 | 311 00521 | 311 00522 |
| 312 00518 | 312 00519 | 1,2 | 312 00520 | 312 00521 | 312 00522 |
| 313 00518 | 313 00519 | 1,2 | 313 00520 | 313 00521 | 313 00522 |
| 314 00518 | 314 00519 | 1,2 | 314 00520 | 314 00521 | 314 00522 |
| 315 00518 | 315 00519 | 1,2 | 315 00520 | 315 00521 | 315 00522 |
| 316 00518 | 316 00519 | 1,2 | 316 00520 | 316 00521 | 316 00522 |
| 317 00518 | 317 00519 | 1,2 | 317 00520 | 317 00521 | 317 00522 |

Floating contacting principle:

- H: sleeve length
- h: front distance, distance of measuring axis to bottom of the bore
- D_{max}: maximum Ø to be measured
- s: measuring range = 0,2 mm



OD dimensions



OD measuring sleeve Ø 60 mm



OD measuring sleeves in special design

Indicating Plug Gauge OD

SERIES 300-326

OD CROSS SLEEVE [WITH RUNNERS]

| nominal-Ø [mm] | h [mm] | cross sleeve with runners Code | h [mm] | cross sleeve with runners Code | h [mm] | cross sleeve Code |
|----------------|--------|--------------------------------|--------|--------------------------------|--------|-------------------|
| 130,1 - 150 | 7 | 311 00001 | 18 | 311 00000 | 6 | 311 00002 |
| 150,1 - 200 | 7 | 312 00001 | 18 | 312 00000 | 6 | 312 00002 |
| 200,1 - 250 | 7 | 313 00001 | 18 | 313 00000 | 6 | 313 00002 |
| 250,1 - 300 | 7 | 314 00001 | 18 | 314 00000 | 6 | 314 00002 |
| 300,1 - 350 | 7 | 315 00001 | 18 | 315 00000 | 6 | 315 00002 |
| 350,1 - 400 | 7 | 316 00001 | 18 | 316 00000 | 6 | 316 00002 |
| 400,1 - 450 | 7 | 317 00001 | 18 | 317 00000 | 6 | 317 00002 |
| 450,1 - 500 | 7 | 318 00001 | 18 | 318 00000 | 6 | 318 00002 |

ESU setting master therefore see page 15



cross sleeve with runners from Ø 130 mm for through and deep bores

SPECIAL DESIGN ON INQUIRY

- with integrated inductive measuring probes from Ø 25 mm
- measuring contact and/or sleeve out of delrin for scratch-sensitive surfaces or polished workpieces
- front distance „h“ non standard
- measuring sleeve for automatic measuring
- multiple measuring axes
- OD measuring sleeve for parallel distances
- special profiles for extruders or for housing of toothed wheel pumps
- measuring contacts in wedge-design
- taper measurement

OD HOLDER

with thread connection M11 x 0,75 for direct connection to all OD measuring sleeves

OD HOLDER

| length [mm] | Code |
|-----------------------------------------------------------------------------------------------|-----------|
| 50 | 320 00000 |
| 105 | 320 00001 |
| 235 | 320 00002 |
| greater length on inquiry | |
| holder F, especially for electronic length measuring probes with fine adjustment, 110 mm long | 320 00004 |
| strengthened holder with tube Ø 18 mm, recommended for sleeve Ø > 60 mm | |
| 145 | 320 00038 |
| 235 | 320 00039 |
| holder with retraction, 70 mm long, recommended for blind bore sleeves | 320 00042 |

different threads on inquiry



OD holders

MEASURING DEPTH EXTENSION

for measuring also in large depth, interchangeable, therefore very flexible for different measuring depth

MEASURING DEPTH EXTENSION

| length [mm] | Ø 4,0 mm for OD Ø 4,0-6,5 mm | Ø 6,5 mm for OD Ø 6,5-12 mm | Ø 12 mm for OD from Ø 12 | Ø 18 mm for OD from Ø 60 |
|-------------|------------------------------|-----------------------------|--------------------------|--------------------------|
| 50 | 323 00100 | 323 00110 | 323 00008 | - |
| 100 | 323 00101 | 323 00111 | 323 00000 | 323 00004 |
| 250 | 323 00103 | 323 00113 | 323 00001 | 323 00005 |
| 500 | - | - | 323 00002 | 323 00006 |
| 1000 | - | - | - | 323 00007 |

Please let us know the diameter of the corresponding OD sleeve with your order. Extensions for measuring sleeves < 4 mm: on inquiry.



OD measuring depth extensions

Accessories for Plug Gauge OD

SERIES 300-326

FLOATING HOLDER

for the use in measuring devices with automatic measuring gauge feeding

FLOATING HOLDER

| | Code |
|---------------------------------|-----------|
| for OD holder 105 | 629 00003 |
| ∅ 20 mm for automatic measuring | 321 00000 |

ANGLE PIECE

| | Code |
|----------------------------------------------|-----------|
| 90° with thread M11 x 0,75 | 324 00000 |
| 90° for strengthened OD holder, tube ∅ 18 mm | 324 00002 |
| 90° in short design | 324 00001 |

DEPTH STOP

for measuring in reproducible measuring depths and for eliminating the tilting error. Please indicate with your order: minimum/maximum measuring depth.

SET COLLAR [CLAMPED ON SLEEVE]

| diameter measuring sleeve [mm] | Code |
|--------------------------------|-----------|
| 3,0 - 40 | 322 00000 |
| 40,1 - 60 | 322 00001 |

(due to the weight only up to max. ∅ 60 mm)

3-POINT DEPTH STOP [CLAMPED ON SHAFT]

| diameter measuring sleeve [mm] | Code |
|--------------------------------|-----------|
| 30 - 50 | 322 00019 |
| 50,1 - 80 | 322 00020 |
| 80,1 - 100 | 322 00021 |
| 100,1 - 150 | 322 00022 |

BRIDGE DEPTH STOP FOR DEEP BORES [CLAMPED ON SHAFT]

| diameter measuring sleeve [mm] | Code |
|--------------------------------|------------|
| 3 - 50 | 322 00007 |
| 50,1 - 80 | 322 00008 |
| 80,1 - 100 | 322 00009 |
| > 100 | on inquiry |

STAND

| | Code |
|------------------------------------------------------|-----------|
| with clamping-∅ 12 mm for holder OD 105 | 325 00000 |
| with clamping-∅ 18 mm for strengthened holder OD 145 | 325 00004 |



stand for OD with angle piece, plug gauge OD, depth stop, holder and precision indicator



depth stops for OD plug gauge



OD plug gauge with two measuring axes

Precision Bore Gauge **SBO/SBU**

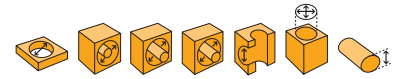
FOR MEASURING INTERNAL AND EXTERNAL DIAMETERS, FOR BORES AROUND A HUB/WITH BORING BAR LEFT IN THE WORKPIECE, FOR CENTRING SHOULDERS, FLANGES ETC.

Manufactured individually to measure a definite bore diameter around a hub (SBO) or around a boring bar or similar (SBU); The alignment of the gauge requires the support on the bottom of the bore or on a plane surface. High measuring accuracy. High measuring certainty. Delivery without dial gauge.

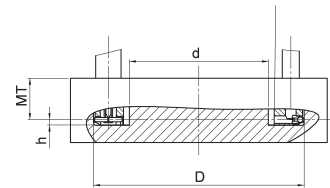
ORDER DATA **SBO/SBU**

| |
|--------------------------------------------------------------------|
| - bore diameter with tolerance D |
| - diameter and height of the hub/boring bar d |
| - measuring depth MT |
| - distance of the meas. axis to the bore bottom - front distance h |
| - drawing of workpiece and/or workpiece |
| Option: special setting masters |

SERIES 155



SBO precision bore gauge



SUBITO® Precision Bore Gauge **SL**

FOR MEASURING BORES WITH BORING BAR LEFT IN THE WORKPIECE

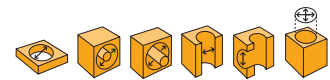
Self-centring bore gauge for determining bore diameters, for instance with boring bar left in the workpiece.

Delivery SL: measuring gauge with column (mm- or Inch-graduation) for pre-setting of the diameter, in case, without dial gauge.

SUBITO® SL

| application range [mm] | max. Ø of boring bar [mm] | measuring depth [mm] | Code |
|------------------------|---------------------------|----------------------|-----------|
| 25 - 70 | 45 | 12 | 150 0000 |
| 35 - 105 | 70 | 17,5 | 151 00000 |
| 100 - 210 | 130 | 30 | 152 00000 |
| 100 - 280 | 130 | 30 | 153 00000 |
| 200 - 500 | 220 | 30 | 154 00000 |

SERIES 150-154



SUBITO® SL

Measuring gauge for outside diameters **SLA**

FOR FLEXIBLE MEASUREMENT OF OUTSIDE DIAMETERS.

Self-centring measurement for flexible measuring of outside diameters.

Delivery SLA: measuring gauge with scaled column to preset the diameter, in case, without dial gauge

SLA

| application range [mm] | Code |
|------------------------|-----------|
| 20 - 45 | 150 00500 |
| 35 - 70 | 151 00500 |
| 60 - 130 | 152 00500 |
| 120 - 220 | 153 00500 |

SERIES 150-154



SUBITO® SLA

Ring Gauge for outside diameter **MRD**

TO MEASURE OUTSIDE DIAMETERS IN THE RANGE
20 - 80 MM

Self-centring measuring gauge to measure the outside diameter 20-80 mm. Individually designed for the diameter to be measured through a guiding sleeve. Floating contacting = two moveable measuring contacts. For setting a cylindrical plug gauge is required. Delivery without dial gauge and without cylindrical plug gauge. On inquiry

SERIES 155

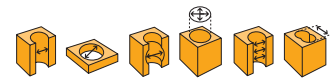


MRD Ring Gauge

SUBITO® SD with direct measuring axis **SD**

FOR MEASURING LARGE BORE DIAMETERS
FROM 280 MM

The display of the bore diameter is made by a mechanical or electronic dial gauge which is integrated directly in the measuring gauge. The measuring travel depends on the dial gauge used. With SUBITO® centring and SUBITO® measuring pins. Delivery without dial gauge.



SUBITO® SD

SUBITO® SD

| application range [mm] | measuring pin steel Code | measuring pin carbide Code |
|------------------------|--------------------------|----------------------------|
| SD 280 - 510 | 113 00500 | 113 00502 |
| SD 400 - 800 | 114 00500 | 114 00502 |

Option from diameter 400 mm: when using bar gauge block extensions instead of standard measuring range extensions it is possible to measure different diameters with just one setting reference.

Measuring Gauge for internal threads

FOR MEASURING THE PITCH DIAMETER

Based on proven SCHWENK internal measuring gauges. Application range: 8-200 mm. Thread measuring insert included. Delivery without gauge holder OSIMESS® or ON, without thread setting master and without dial gauge. For calibration a corresponding thread setting master is necessary.

MEASURING GAUGE FOR INTERNAL THREADS

| type | application range [mm] | Code |
|------------------------------------------|------------------------|-----------|
| measuring gauge for internal threads OSG | M8 - M10 | 627 00500 |
| OS holder with retraction | | 626 00010 |
| measuring gauge for internal threads ONG | M10 - M70 | 195 00999 |
| ON holder for split probe | | 190 00000 |
| measuring gauge for internal threads SNG | M80 - M130 | 166 00500 |
| no separate gauge holder necessary | M130 - M200 | 166 00503 |



OSG measuring gauge for internal threads



SNG measuring gauge for internal threads

Internal Chamfer Gauge IFM **IFM**

FOR DIRECT MEASURING THE MAJOR DIAMETER OF INTERNAL CHAMFERS AND TAPERS

Delivery with a special ratio dial gauge (reading 0,01 mm) for indication of measuring result. Holder with 90° or 127° taper. The gauge is preset.

INTERNAL CHAMFER GAUGE IFM

| type | measuring range [mm] | Code |
|-------------|----------------------|-----------|
| IFM 20/90° | 0,5 - 20 | 194 00000 |
| IFM 40/90° | 20 - 40 | 194 00001 |
| IFM 20/127° | 0,5 - 20 | 194 00011 |
| IFM 40/127° | 20 - 40 | 194 00012 |

taper 60° on inquiry

SPARE PARTS IFM

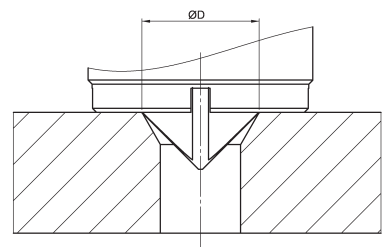
| type | Code IFM 20 | Code IFM 40 |
|-----------------------------|-------------|-------------|
| special dial gauge for 90° | 194 10006 | 194 10016 |
| holder with 90° taper | 194 00003 | 194 00004 |
| special dial gauge for 127° | 194 10017 | 194 10017 |
| holder with 127° taper | 194 00005 | 194 00006 |

taper 60° on inquiry

SERIES 194



IFM Internal Chamfer Gauge



measuring principle IFM

Chamfer Length Measuring Gauge FLM **FLM**

TO MEASURE THE OUTSIDE OR INSIDE CHAMFER LENGTH

Smallest bore \varnothing 6 mm, min. chamfer length 0,2 mm, max. chamfer length 5 mm, chamfer angle $\geq 30^\circ$. Delivery including setting piece as sharp edge ring and dial gauge.

CHAMFER LENGTH MEASURING GAUGE FLM

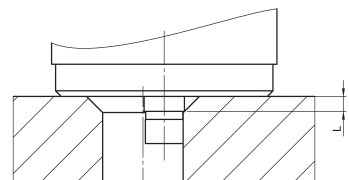
| type | Code |
|------------------------------------|-----------|
| chamfer length measuring gauge FLM | 194 00100 |

SPARE PARTS FLM

| type | Code |
|---------------|-----------|
| depth gauge | 194 00102 |
| setting piece | 194 00103 |



FLM Chamfer Length Measuring Gauge



measuring principle FLM

Precision Indicator mytast®

FOR PRECISION BORE GAUGES OF ALL SERIES

Precision indicator according to DIN 879, ball bearing guided tracer rod, shock-proof, 7 jewel movement, measuring force 1 N, adjustable tolerance markings, clamping shaft Ø 8 h6, with contact point 16 mm, delivery in plastic box.

MYTAST*/CENTITAST

| type | reading | range [mm] | Code [mm] | model |
|-----------|---------|------------|-----------|----------|
| mytast* | 0,001 | 0,1 | 610 00000 | standard |
| centitast | 0,01 | 0,5 | 611 00000 | standard |

deviating measuring force and contact points on inquiry

Mechanical Dial Gauges

FOR PRECISION BORE GAUGES OF ALL SERIES

Design according to DIN 878, clamping Ø 8 h6, delivery in plastic box.

DIAL GAUGE

| reading [mm] | housing Ø [mm] | range [mm] | Code |
|--------------|----------------|------------|-----------|
| 0,01 | 58 | 10,0 | 600 00000 |
| 0,01 | 40 | 3,0 | 600 00001 |
| 0,001 | 58 | 1,0 | 600 00002 |
| 0,001 | 40 | 1,0 | 600 00003 |

Digital Dial Gauges

FOR PRECISION BORE GAUGES OF ALL SERIES

Features:

- high-contrast LCD digital display
- operating and display unit turnable 280° (except for 1075 R)
- lifter protection cap on the measuring pin end
- clamping shaft and measuring pin out of hardened stainless steel
- immediate readiness through reference system
- data exit MarConnect (with optical data cable for USB, RS232C or Digimatic)

DIGITAL DIAL GAUGES

| type | measuring range [mm/inch] | resolution [mm] | Code |
|---------|---------------------------|-------------------------|-----------|
| 1075 R | 12,5 / 0,5 | 0,01 | 613 00000 |
| 1086 R | 12,5 / 0,5 | 0,01 | 613 00014 |
| 1086 R | 12,5 / 0,5 | 0,01/0,004/0,001/0,0005 | 613 00011 |
| 1087 BR | 12,5 / 0,5 | 0,01/0,004/0,001/0,0005 | 613 00012 |

1086 R: with adjustable factor e.g. for IFM.

1087 BR: the reversal point can be determined automatically when measuring with a two point internal comparator measuring instrument (SUBITO®, OSIMESS®) when tipping the gauge. The actual value is stored through the MIN-function and shown on the display.

SERIES 610-611



mytast®



centitast

SERIES 600



dial gauges, housing Ø 58 mm and 40 mm

SERIES 613



1087 BR

mytast® is a registered brand name of SCHWENK Beteiligungs-GmbH & Co. KG.

Manufacturer certificate for all SCHWENK measuring gauges see page 32

Tungsten carbide precision balls

SERIES 680

EXTREMELY WEAR-RESISTING AND
NON-CORRODING

Applications:

measuring gauges, calibration tools, high-pressure valves, colour squirt devices,
ball point pens, aerospace

Material: sintered metal 94% WC and 6% Co

Hardness: HV 1550 ±50

Precision: Grade 25

TUNGSTEN CARBIDE BALLS

| diameter | | Code | diameter | | Code |
|----------|--------|-----------|-----------|--------|-----------|
| [mm] | [inch] | | [mm] | [inch] | |
| 0,793750 | 1/32 | 680 00008 | 10,50 | | 680 00047 |
| 1,00 | | 680 00011 | 11,00 | | 680 00048 |
| 1,190625 | 3/64 | 680 00012 | 11,50 | | 680 00050 |
| 1,50 | | 680 00015 | 12,00 | | 680 00052 |
| 1,58750 | 1/16 | 680 00016 | 12,69988 | 1/2 | 680 00054 |
| 2,00 | | 680 00018 | 13,00 | | 680 00055 |
| 2.381250 | 3/32 | 680 00019 | 13,493750 | 17/32 | 680 00056 |
| 2,50 | | 680 00020 | 14,00 | | 680 00058 |
| 2,778125 | 7/64 | 680 00021 | 14,2875 | 9/16 | 680 00059 |
| 3,00 | | 680 00022 | 14,50 | | 680 00060 |
| 3,1750 | 1/8 | 680 00023 | 15,081250 | 19/32 | 680 00062 |
| 3,50 | | 680 00024 | 15,8750 | 5/8 | 680 00064 |
| 3,968750 | 5/32 | 680 00025 | 16,00 | | 680 00065 |
| 4,00 | | 680 00026 | 16,668750 | 21/32 | 680 00066 |
| 4,50 | | 680 00027 | 17,00 | | 680 00067 |
| 4,76250 | 3/16 | 680 00028 | 17,46250 | 11/16 | 680 00068 |
| 5,00 | | 680 00029 | 18,00 | | 680 00069 |
| 5,50 | | 680 00030 | 19,00 | | 680 00071 |
| 5,556250 | 7/32 | 680 00031 | 19,050 | 3/4 | 680 00072 |
| 6,00 | | 680 00032 | 19,843750 | 25/32 | 680 00073 |
| 6,350 | 1/4 | 680 00033 | 20,00 | | 680 00074 |
| 6,50 | | 680 00034 | 20,6375 | 13/16 | 680 00075 |
| 7,00 | | 680 00035 | 21,00 | | 680 00076 |
| 7,143750 | 9/32 | 680 00036 | 21,431250 | 27/32 | 680 00077 |
| 7,50 | | 680 00037 | 22,00 | | 680 00078 |
| 7,93750 | 5/16 | 680 00038 | 22,2250 | 7/8 | 680 00079 |
| 8,00 | | 680 00039 | 23,00 | | 680 00080 |
| 8,50 | | 680 00040 | 23,81250 | 15/16 | 680 00081 |
| 8,731250 | 11/32 | 680 00041 | 24,00 | | 680 00082 |
| 9,00 | | 680 00042 | 24,606250 | 31/32 | 680 00083 |
| 9,50 | | 680 00043 | 25,00 | | 680 00084 |
| 9,5250 | 3/8 | 680 00044 | 25,40 | 1 | 680 00085 |
| 10,00 | | 680 00045 | 26,00 | | 680 00086 |



tungsten carbide precision balls

further dimensions on inquiry

Ruby precision balls

SERIES 680

RESISTANT TO HIGH TEMPERATURES,
WITH VERY LOW WEIGHT, ACID-RESISTING AND
GOOD SLIDING QUALITY

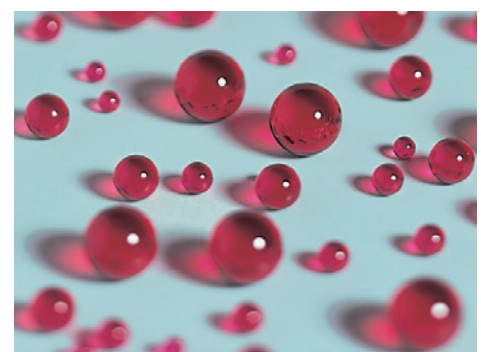
Applications:

measuring gauges, contact balls for dial gauges, aerospace, chemical and
nuclear industry

Material: aluminium-oxide

Hardness: Knoop 2000

Precision: Grade 25



ruby precision balls

Ceramic precision balls

RESISTANT TO HIGH TEMPERATURES,
INSENSITIVE TO ABRASION AND
AGGRESSIVE MEDIA

Applications:

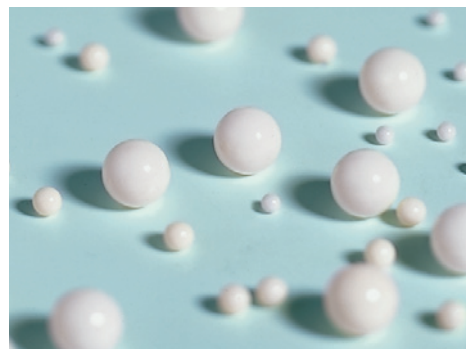
measuring gauges, valves, flowmeters, chemical and nuclear industry

Material: aluminium-oxide

Hardness: Knoop 2000

Precision: Grade 25

SERIES 680



ceramic precision balls

Special measuring inserts

ACCORDING TO CUSTOMER CONFIGURATION

for:

- dial gauges, precision indicators
- electronic probes
- measuring machines
- measuring devices
- manufactured according to specifications

SERIES 681



special measuring inserts

Linear stroke ball bearing

FOR EASY BLACKLASH-FREE LINEAR MOVEMENTS

LINEAR STROKE BALL BEARING

| designation | Code |
|-----------------------------------------------------------------------------|-----------|
| ball bearing traveller with clamping shaft | |
| Ø 8 h6, with contact point 6 mm and 16 mm, with bellows, travel h = 3 mm | 614 00000 |

SERIES 614



linear stroke ball bearing

Measuring instrument test device **MPV**

FOR CHECKING ONE-AXIAL
LENGTH MEASURING GAUGES

TEST DEVICE MPV

| | Code |
|-------------------------------------------------------------------------------------------|-----------|
| measuring instrument test device MPV, for checking | |
| - internal 2-point-contact comparator gauges (for instance SUBITO®, OD, OSIMESS® etc.) | |
| - dial gauges | 650 00000 |
| - precision indicators | |
| for deviation, repeatability, hysteresis | |

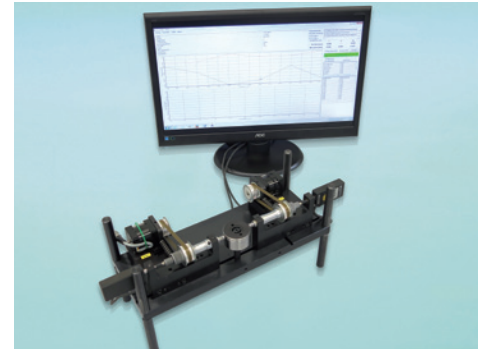
Delivery MPV:

- main stand, two setting units with integrated micrometer screws
- angle piece with clamping lug, adjustable anvil
- adapter for various measuring sleeves connection threads

Options on inquiry:

- reference sensor
- hardware for the data logging for TastkalWin
- data logging software TastkalWin
- drive units for the automatical checking run of 2-point internal measuring gauges

SERIES 650



MPV complete system

Manufacturer calibration report

FOR SCHWENK MEASURING GAUGES

MANUFACTURER CALIBRATION REPORT FOR MEASURING GAUGES

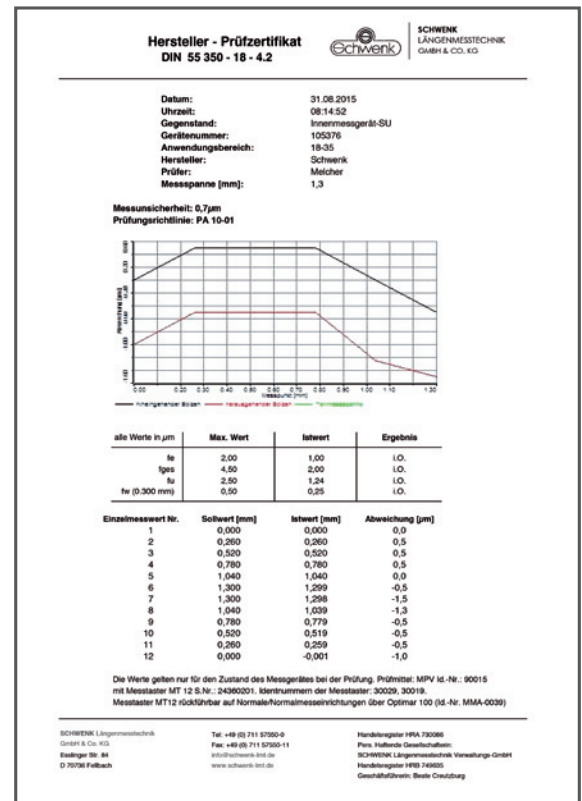
Scope of testing:

checking of repeatability, deviation, hysteresis and total deviation (for comparator measuring gauges without dial gauge clamped in) at several measuring points, as well as visual and functional checking.

MEASURING GAUGES

| description | Code |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------|
| SUBITO® precision bore measuring gauges series SU, SK, SV, SS, SP, KT and SCA up to SU 50-150 included | 699 00176 |
| SUBITO® precision bore measuring gauges series SU, SK, SV, SS, SP, KT and SCA, from SU 100-160 as well as SMT, SW, SE, SN, ST, SL | 699 00193 |
| OSIMESS® split-ball probe OS, OSH, OSS up to probe 4,0 included | 699 00194 |
| OSIMESS® split-ball probe OS, OSH, OSS from probe 4,5 | 699 00178 |
| precision indicator mytast®/centitast according to DIN 879 part 1 | 699 00179 |
| dial gauge with 10 mm travel according to DIN 878 | 699 00185 |
| OD plug gauges up to Ø 200 mm | 699 00180 |
| groove measuring gauge ON/ONM | 699 00181 |
| internal chamfer gauge IFM | 699 00204 |
| precision bore gauge SBO up to Ø 200 mm | 699 00203 |

SERIES 699



manufacturer calibration report

Manufacturer calibration report

SERIES 699

FOR SCHWENK MEASURING GAUGES

SETTING RINGS

| description | Code |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------|
| setting rings according to DIN 2250 and OSIMESS® setting rings according to works standard, checking in 1 level; for Ø 0,5 - 1,4 mm | 699 00195 |
| setting rings according to DIN 2250 and OSIMESS® setting rings according to works standard, checking in 3 levels; from Ø 1,75 mm | 699 00209 |

MEASURING ANVILS ESU

| description | Code |
|-----------------------------------------------------------------------------------------------------------------|-----------|
| pair of measuring anvils for setting device ESU, checking for evenness deviation and the mean surface roughness | 699 00187 |

MEASURING TAPES

| description | | Code |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------|
| outside circumference measuring tape C-tape CJU 950 and CJU 2200 and CJL up to 2200 | checking of 1 scale (Ø or circumference) at several measuring points | 699 00188 |
| outside circumference measuring tape CJU 950 and CJU 2200 | checking of both scales at several measuring points | 699 00189 |
| inside and outside circumference measuring tape from CJU 3460 up to CJU 11.010 and IUB and CJL from 3500 | checking of 1 scale (Ø or circumference) at several measuring points | 699 00183 |
| inside and outside circumference measuring tape from CJU 3460 up to CJU 11.010 and IUB | checking of both scales at several measuring points | 699 00184 |
| contour measuring gauge NOVOMETER | checking of the diameter at several measuring points | 699 00186 |

SCALES

| description | Code |
|----------------------------------------------------------------------------------------------------------------------|-----------|
| checking scales, work scales like e.g. rulers, steel scales, tape measures, for lengths up to 1.200 mm | 699 00196 |
| checking scales, work scales like e.g. rulers, steel scales, tape measures, for lengths from 1.200 mm up to 2.000 mm | 699 00197 |

For all calibration tasks, the traceability to the national standards is ensured. This is shown in each certificate.

General Terms and Condition of Sale and Delivery

OF SCHWENK LÄNGENMESSTECHNIK GMBH & CO. KG
(HEREINAFTER REFERRED TO AS "SCHWENK LMT")

A. General information, scope

- (1) Our General Terms and Conditions of Sale and Delivery (hereinafter referred to as "General Terms and Conditions") apply exclusively. Any opposing, supplementary or deviating client's conditions will not be accepted, unless explicitly agreed to in writing. Our General Terms and Conditions shall also apply in case we render deliveries and services to the customer without reservations and with the knowledge of any conditions of the customer that contradict or deviate from our conditions. These conditions shall also apply for future business transactions even if these have not once again been explicitly agreed upon.
- (2) Any rights to which SCHWENK LMT is entitled to under statutory provisions or other agreements that go beyond these General Terms and Conditions shall remain unaffected.
- (3) Our General Terms and Conditions shall only apply towards organizations in the sense of double sections §§ 14, 310 I BGB (German Civil Code) or legal persons of public law.

B. Quotes and offers, acceptance, contractual content

- (1) Unless explicitly stated otherwise our offers are always non-binding. Our written order confirmation is relevant for the contractual agreement. Subsidiary agreements and changes shall always be confirmed by us in writing.
- (2) We reserve all proprietary and intellectual property rights as well as copyrights to any and all tender documents (including any samples, illustrations, drawings, product descriptions provided, etc.). Such documents must not be made available to third parties or be used for purposes that go beyond the scope of the contract.
- (3) We reserve the right to implement design changes, improvements as well as other changes to technical data and performance features to an extent reasonably acceptable to the customer.
- (4) Any documents provided to the customer together with the quotation request or the order (drawings, samples and such) form a binding basis for preparing a quote.

C. Prices, payment, maturity

- (1) All prices are net prices, unless (in individual cases) otherwise agreed upon in writing and the prices are stated in euro, ex works, excluding packaging expenditures, insurance, taxes, transport costs, duties, etc. plus statutory VAT applicable at the time of delivery. The prices will be calculated on the basis of the respective price list applicable on the order date.
- (2) For small orders we charge a minimum quantity surcharge based on the current price list valid at the order time.
- (3) Unless otherwise agreed the following payment conditions shall apply:
 - payment within 10 days from date of invoice: 2 % discount,
 - payment within 30 days net from date of invoice.This shall also apply to partial deliveries. Repair invoices shall immediately become due and payable without a discount. Payment by the customer shall not be deemed to have been made until the amount is credited on our account. In case of payment by check, payment is considered rendered once the check has been cashed in.
- (4) The retention of payments or the set-off because of any counter-claims shall only be admissible in case of uncontested, acknowledged or legally recognized counter-claims of the customer.

D. Delivery dates, impossibility of delivery, partial delivery, delay in acceptance

- (1) The delivery dates shall only be binding if explicitly confirmed by us in writing. The delivery time shall commence on the date of order confirmation.
However, this shall only apply in case all technically and otherwise contractually relevant details have been clarified with the ordering party (such as a down payment, material supply etc.) and the ordering party has completely fulfilled the required obligations to cooperate in time. If this is not the case the delivery time shall be extended accordingly, unless SCHWENK LMT is responsible for the delay.
- (2) We reserve the right to object to unfulfilled contracts.
- (3) The delivery time shall be deemed to have been met if the object of delivery has left SCHWENK LMT's works in Fellbach by the expiry of the delivery period or the readiness for dispatch has been communicated.
- (4) In case shipment or acceptance of the object is delayed for reasons within the customer's responsibility, the customer shall bear the costs incurred due to the delay as of one month after notice of readiness for delivery and/or acceptance has been given.
- (5) In case the delivery time is delayed due to force majeure, strike or other events beyond the scope of influence of SCHWENK LMT, the delivery period shall be extended accordingly. SCHWENK LMT shall inform the ordering party on the beginning and end of such circumstances as soon as possible.
- (6) The ordering party can withdraw from the contract without setting a grace period if SCHWENK LMT is definitely unable to fulfill all his obligations under this contract before the transfer of risk.
Furthermore, the ordering party can withdraw from the contract if the execution of a part of the delivery becomes impossible or in case the ordering party has a legitimate interest in rejecting partial delivery. If this is not the case the ordering party shall pay the contractually agreed price for the partial delivery. The same shall apply in case of impossibility of performance of SCHWENK LMT. Apart from that H and M shall apply.
- (7) In case of a delay in acceptance caused by the customer or in case he culpably infringes his / her obligation to cooperate, SCHWENK LMT shall be entitled to claim for damages, including additional expenditure. The right to assert further claims or rights shall remain unaffected.
- (8) In case the prerequisites of paragraph (4) shall apply, the risk of accidental loss or deterioration of the purchase object shall be transferred to the customer at the time when the latter has got into arrears of acceptance or payment of debts.
- (9) Partial deliveries are admissible if the deliveries can be divided and are (reasonably) acceptable to the ordering party. SCHWENK LMT is entitled to claim partial payments and down payments in this respect.
- (10) The deliveries and services (performance of the contract) are subject to the proviso that there are no obstacles to performance based on national or international regulations, in particular export control regulations, embargoes or other sanctions. The contracting parties undertake to provide all information and documents required for the export/transfer /import. Delays due to export inspections or approval procedures shall invalidate deadlines and delivery times. If necessary permits are not granted, the contract shall be deemed not to have been concluded with regard to the parts concerned; claims for damages shall be excluded to this extent and due to the above-mentioned failure to meet deadlines.

E. Transfer of risks

- (1) The risk of accidental loss or accidental deterioration shall be transferred to the ordering party once the delivery object has been handed over to the transport company (also in case partial deliveries are made or in case SCHWENK LMT has also taken over other items, e. g. transport costs or delivery and installation).
- (2) In case delivery and acceptance are delayed or not possible due to circumstances beyond SCHWENK LMT's responsibility, the risk shall be transferred to the ordering party as of the time of receipt of the notification on the readiness for shipment. On explicit and written request and on expense of the customer, insurance can be concluded for the goods.

F. Packing

Unless individually agreed on in the contract, packing shall be charged at cost price. On request, the packaging material will be taken back on delivery.

G. Reservation of title

- (1) All the goods delivered shall remain our property until complete fulfillment of all existing or future claims arising out of the business relationship with the customer.
If the customer acts in a way contrary to the contractual obligations, in particular in case of default of payment we are entitled to take back the delivered goods. In case insolvency proceedings are opened against the customer, SCHWENK LMT is entitled to withdraw from the contract and demand the immediate return of the object of delivery.
SCHWENK LMT's taking back of the goods delivered shall not constitute a withdrawal from the contract. After taking back the goods SCHWENK LMT is entitled to dispose of them; the revenue from such utilization must be set off against the customer's liabilities minus any reasonable costs of utilization.
- (2) In the event of seizures or other action by third parties, the customer shall notify us immediately in writing so we can file a lawsuit in accordance with sec. 771 German Code of Civil Procedure (ZPO). Unless the third party is able to refund the

court and out-of-court costs incurred by us in accordance with sec. 771 German Code of Civil Procedure (ZPO), the customer shall be liable for any losses incurred by us.

- (3) The customer is entitled, subject to revocation, to the intended further sale of the delivered goods in the framework of the ordinary course of business. Already now, the customer transfers all claims to the amount of the final invoice amount (including VAT) of our claim, which arises from reselling the goods to his customers or third parties. We hereby accept the assignment. The assigned claims serve to secure all claims in accordance with paragraph 1. On our request the customer is obliged to immediately disclose the assignment to his customers and to provide the information and documents necessary to assert our rights.
- (4) For the time of the reservation of title the goods shall be treated with due care and the customer shall sufficiently insure the goods, at the original value and at his expense, against fire, water and theft.
- (5) On the ordering party's request, SCHWENK LMT is obliged to release the securities to which the ordering party is entitled to if the realizable value of the security, taking into account the downward valuation adjustment, which is customarily used by banks, exceeds the receivables arising from the business transaction with the customer to secure by more than 15%. As regards the evaluation, the invoiced value of the products subject to retention of title and, the nominal value of receivables shall be authoritative. The selection of the items to be released in detail lies at the discretion of SCHWENK LMT.

H. Warranty

- (1) SCHWENK LMT shall assume warranty that the delivered goods are suitable for the use designated in the contract and that they are free of defects.
- (2) The goods shall be checked and verified on receipt. Any obvious defects of the goods shall be immediately, and at the latest within two weeks as of receipt of the goods, contested in writing. Hidden defects must be reported within 2 weeks after discovery of the defect. Otherwise, the goods are regarded as complete and delivered without faults.
- (3) In case the goods are defective SCHWENK LMT may choose, at its own discretion, repair or replacement. For the repair option, the defective parts shall be sent to SCHWENK LMT's headquarters. Repair works will not be implemented at the place of use. If SCHWENK LMT fails to provide repair or replacement, the ordering party is entitled to reduce the purchase price accordingly or to withdraw from the contract. In order to carry out all subsequent improvements and replacement deliveries deemed necessary to SCHWENK LMT in our fair judgment the ordering party shall grant SCHWENK LMT the necessary time and opportunity.
- (4) The ordering party's right to assert claims on grounds of default is subject to the statute of limitations after 1 year from the time of transfer of risks.
- (5) No warranty is given for damage resulting from any of the following causes: improper or inappropriate use or storage, defective installation or commissioning by the ordering party or a third person, normal wear and tear, dirt, incorrect or negligent handling, in particular excessive usage, improper operating and cleaning agents, substitute materials, chemical, electrochemical or electrical influences unless the damage can be attributed to SCHWENK LMT. The same applies if the labeling by the manufacturer (serial or article number, model name etc.) has been removed or made illegible.
- (6) SCHWENK LMT shall not be liable for damages, which are the result of the design prescribed by the ordering party or the material supplied by the ordering party.

I. Return of goods, conditions of return, delivery

- (1) In principle, properly ordered and delivered goods shall not be taken back. Following different, previous agreements, the return shipment shall be made by the customer free of charge. The goods must be properly packed and transported. Any costs for rework necessary due to an infringement of this obligation shall be borne by the ordering party.
- (2) For return consignments for which SCHWENK LMT does not account (e.g. erroneous order), we charge administrative costs to the amount of 20 % of the value of the goods and a minimum of 20 Euro.
- (3) If a cost estimate is requested for repairs sent to us, the checking and handling charges for preparing the cost estimate will be charged at a flatrate of 17 Euro. In case of an order (repair or new gauge) no flatrate is applicable.

J. Samples

Samples will be charged.

K. Tool costs

Unless other agreements have been made, the tools, moulds and devices made for executing the order shall remain our property. This also applies in case the costs have been invoiced (in part or total) to the customer.

L. Custom-made products

Custom-made products require binding information on design, quantity, etc. in written form when placing an order. Changes or deletions are possible no later than one week after the confirmation date. Thereafter, changes or deletions are only possible against payment of the costs incurred. Custom-made products cannot be returned.

M. Liability, exclusion of liability

- (1) We are liable in accordance with the statutory provisions insofar as the customer asserts claims for damages caused by intent or gross negligence, including intent or gross negligence of our representatives or agents. Insofar as we cannot be charged with intentional or grossly negligent breach of contract the liability for damages is limited to a predictable damage that might typically occur.
- (2) If the delivered object cannot be used by the ordering party for the purposes agreed upon in the contract due to the fault of SCHWENK LMT, the provisions according to M, N are to be applied, to the exclusion of further claims by the customer.
- (3) We do not assume warranty for damages caused by erroneous use of the goods, in particular inappropriate or improper use or storage, incorrect assembly by the client or third parties, unauthorized repair attempts and changes, normal wear and tear, erroneous or negligent treatment etc. beyond our influence and control and in case of unintended use or ignorance of our manuals.
- (4) SCHWENK LMT makes no warranties, in particular no guarantees regarding quality or durability, unless otherwise agreed in writing.
- (5) The limitation period in case of delivery regress is based on the statutory provisions.
- (6) Any additional claim for compensation other than the aforementioned in "M" is, regardless of the legal nature of the asserted claim, excluded.
- (7) Unless otherwise specified or unless mandatory statutory regulations stipulate something else, our liability is excluded. The aforementioned limitation of liability shall not apply to claims for damages of the ordering party in case of injury to life, body or health and for mandatory claims according to the product liability or medicine act (e.g. double sections 1.4 German ProdukthaftG, etc.).
- (8) As far as the liability for compensation against us is excluded or restricted, this shall be applicable as well with respect to the personal liability for compensations of our employees, staff members, representatives and vicarious agents.

N. Data protection

We expressly point out to our business partners that we store and process personal data by use of electronic data processing tools in accordance with the regulations of the Federal Data Protection Act and the Data Protection Basic Regulation.

O. Jurisdiction, German law, contract language, severability clause

- (1) Our business headquarters is the place of performance (to the extent that the customer is a merchant) and also the place of jurisdiction. We are, however, authorized to sue the customer at the court of his place of residence.
- (2) The law of the Federal Republic of Germany shall apply. The terms of the UN Sales Convention shall not apply. The contract language is German.
- (3) Should one of the terms of the General Terms and Conditions become invalid or be or become impracticable, the validity of the remaining sections is not affected.