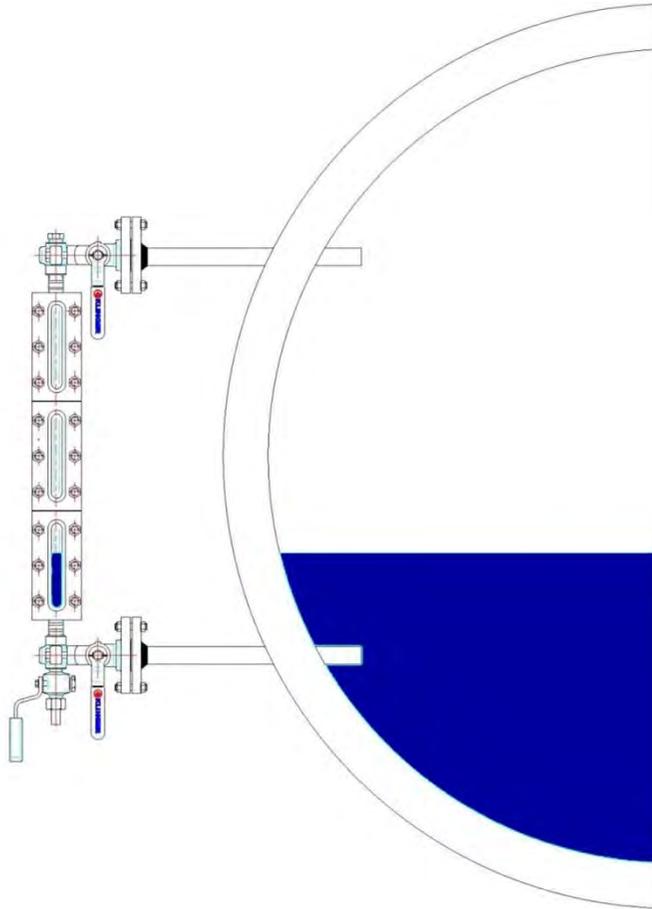




KLINGER ITALY

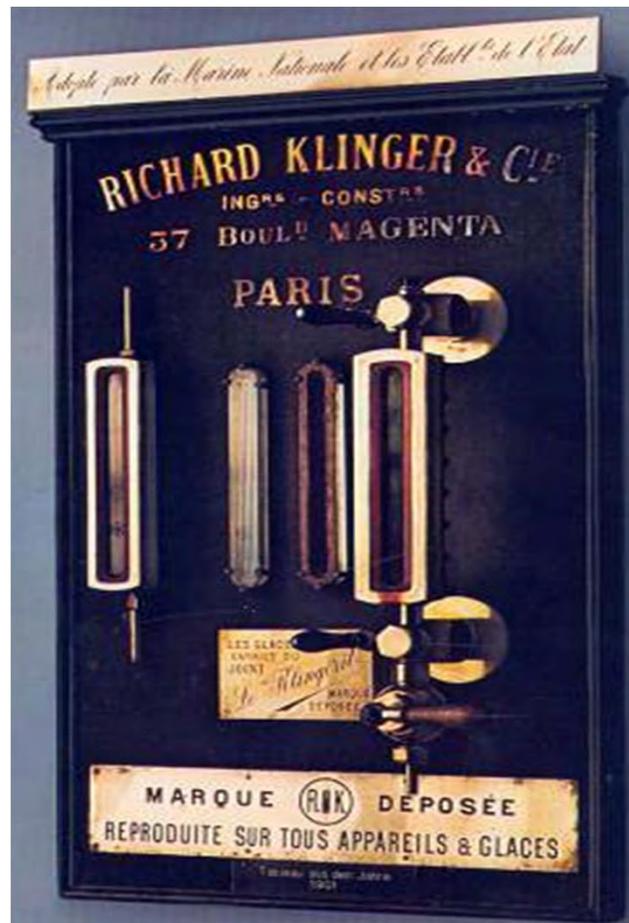
GLASS LEVEL GAUGES



GLASS LEVEL GAUGES

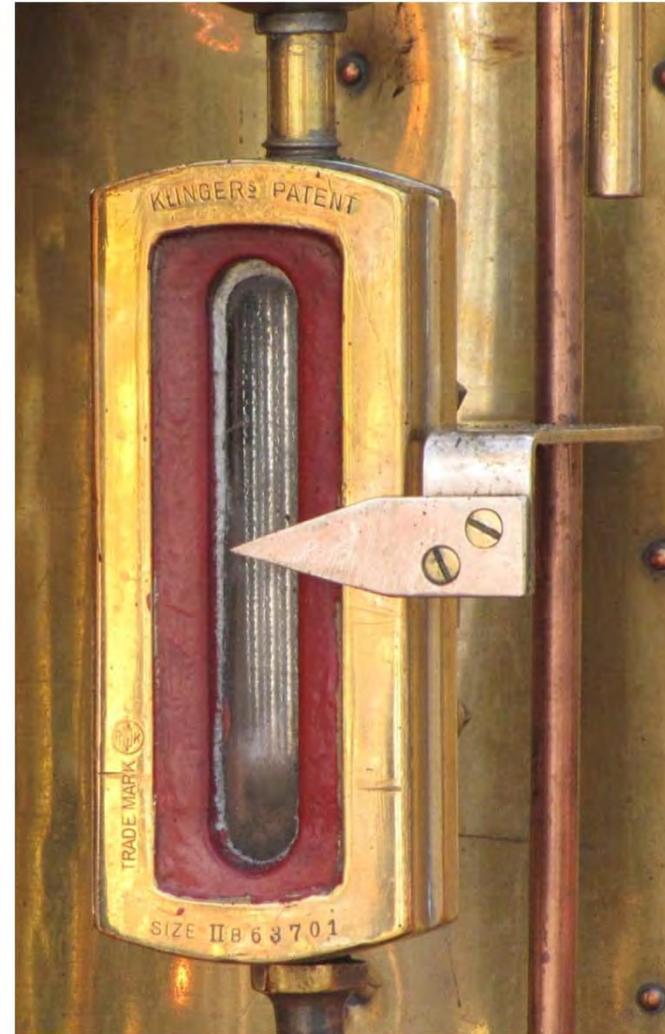
Everywhere liquid
levels have to be
directly read and defined

Glass level gauges were invented and patented in 1888 by Richard Klinger, the founder of the Group of independent KLINGER companies



The first great step into business was at the world exhibition 1901 in Paris

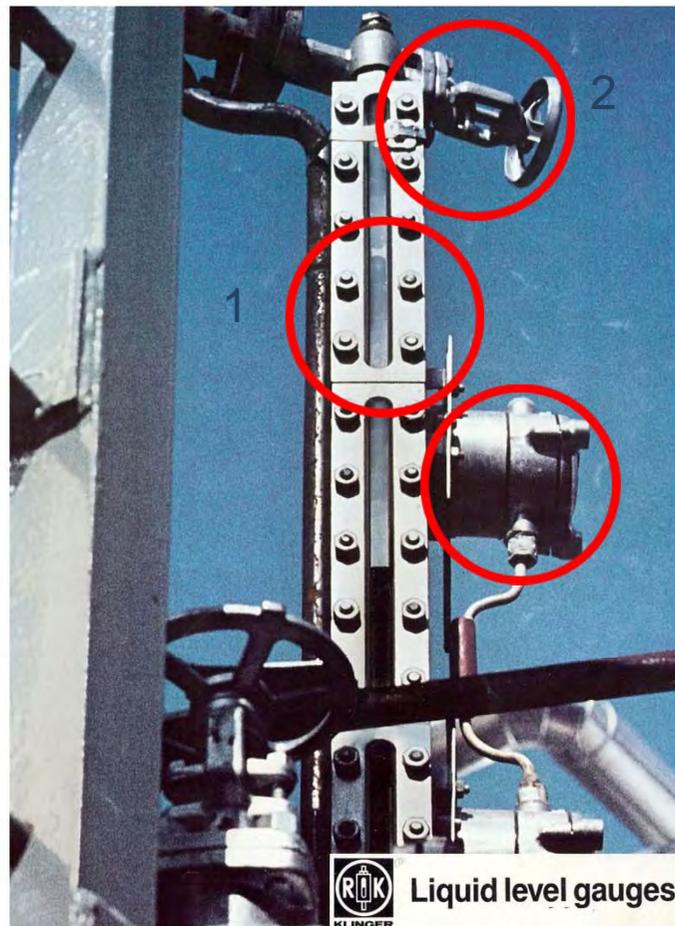
Original KLINGER Level Gauges are used from many years!



MAIN ADVANTAGES

- 1 – Direct view of the fluid level
- 2 – Suitable for steam application
- 3 – No electronic signal, no fault
- 4 – Cheaper solution to check the fluid level
- 5 – Easy maintenance
- 6 – Very long life in service

MAIN COMPONENTS



1 – BODY LEVEL GAUGES

With Glasses (Reflex or Transparent)

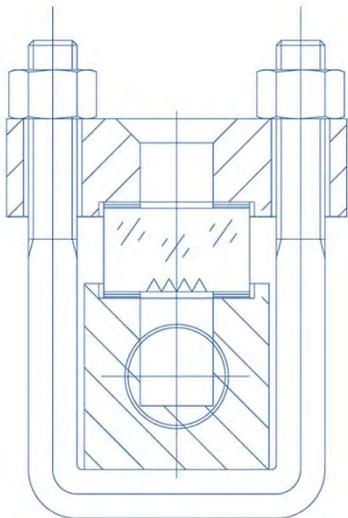
2 – VALVES OR COCKS

To isolate the Level Gauge body
from the utility

3 – ACCESSORIES

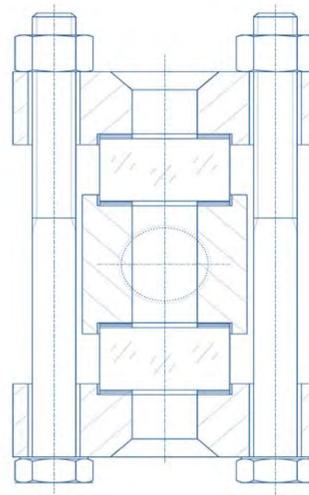
Illuminator Unit
No frost Device
Mica Shields
Heating Tracing

REFLEX
(process & steam)



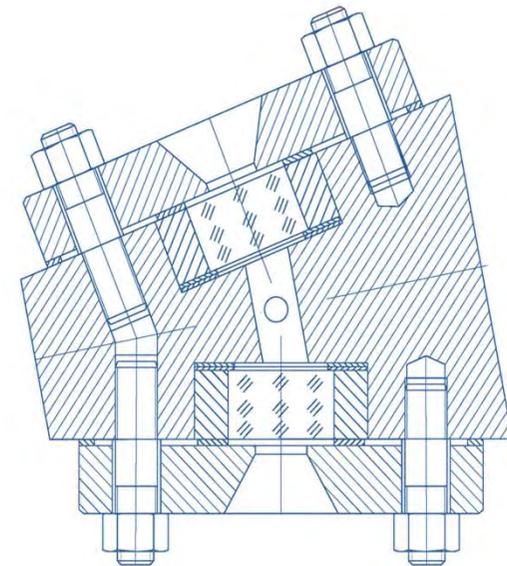
Different Refraction
with Liquid and
Gas (or steam)

TRANSPARENT
(process & steam)



Direct vision through
the two glasses (back
illumination available)

BICOLOUR
(steam)



Different colours between
Water (Green) and Steam
(Red). Back illuminated.



PROCESS APPLICATION

REFLEX:

WATER, CLEAN LIQUID AND COLOURED FLUID

TRANSPARENT:

VISCOUS, DIRTY AND UNCOLOURED FLUID, INTERFACE SERVICE AND AGGRESSIVE FLUID (PROTECTED GLASS)

STEAM APPLICATION

REFLEX

UP TO 32 bar

TRANSPARENT

UP TO 120 bar

BICOLOUR

UP TO 225 bar

Range of Production PROCESS



| PROCESS APPLICATION FOR GLASS LEVEL GAUGES | | | | | | |
|--|----------------------------|------------------------------|---------------------------|---------------------------|------------|---|
| Level Gauge Type | Max Working Pressure (Bar) | Max Working Temperature (C°) | Klinger Level Gauge Model | Klinger Gauge Valve Model | | Klinger Level Gauge RATING / Max Pressure |
| REFLEX | 25 | 400 | R 25 | DG | Offset RAV | PN 25 - ANSI 150 |
| | 100 | 400 | R 100 | DG | Offset RAV | PN 100 - ANSI 600 |
| | 160 | 400 | R 160 | DG | Offset RAV | PN 160 - ANSI 900 |
| | 250 | 400 | R 250 | | Offset RAV | PN 250 - ANSI 1500 |
| | 63 | 400 | UOR Large Chamber | DG | Offset RAV | PN 63 - ANSI 400 |
| | 400 | 120 | A 400 | DVK2 | | PN 400 - ANSI 2500 |
| TRANSPARENT | 16 | 185 | R-D (glass) | D | | PN 16 |
| | 50 | 400 | T 50 | DG | Offset RAV | PN 50 - ANSI 300 |
| | 100 | 400 | T 100 | DG | Offset RAV | PN 100 - ANSI 600 |
| | 160 | 400 | T 160 | DG | Offset RAV | PN 160 - ANSI 900 |
| | 250 | 400 | T 250 | | Offset RAV | PN 250 - ANSI 1500 |
| | 63 | 400 | UOT Large Chamber | DG | Offset RAV | PN 63 - ANSI 400 |
| WELD-PAD | 100 | 400 | UWR - UWT | Not Applicable | | PN 100 - ANSI 600 |
| | 100 | 400 | USR- UST | Not Applicable | | PN 100 - ANSI 600 |

Range of Production STEAM



| STEAM APPLICATION FOR GLASS LEVEL GAUGES | | | | | |
|--|---|------------------------------|---------------------------|---------------------------|---------------------|
| Level Gauge Type | Max Working Pressure (Bar) SATURATED STEAM | Max Working Temperature (C°) | Klinger Level Gauge Model | Klinger Gauge Valve Model | |
| REFLEX | 32 | 239 | K | D | |
| | 20 | 215 | R 25 | D | |
| | 20 | 215 | R 50 | D | |
| | 22 | 219 | R 100 | D | |
| | 32 | 239 | R 160 | D | |
| TRANSPARENT | 10 | 185 | R-D (glass) | D | |
| | 15 | 202 | T 50 | D | |
| | 30 | 235 | T 100 | D | |
| | 40 | 252 | T 160 | D - DA | |
| | 40 | 252 | T 160-XS | D - DA | |
| | 60 | 270 | T 160-XS | DA | |
| | 85 | 298 | T 85 | DA - DVK2 | RAV 957 Seal welded |
| | 85 | 298 | TA 120 | DA | |
| | 120 | 323 | TA 120 | DVK2 | |
| BICOLOUR | 225 | 360 | KTA - 225 | DVK2 | |
| | 180 | 356 | KTA - 180 | DVK2 | |
| | 75 | 291 | KT - 75 | DA - DVK2 | |
| | 25 | 225 | KT - 25 | D - DA | |

MATERIALS

- FS/H CARBON STEEL
- ASTM A105N as standard
- LF2 available for low temperature service at - 46°C
- M/H WETTED PART STAINLESS STEEL
OTHERS IN CARBON STEEL
- AISI 316L and ASTM A105N as standard
- M STAINLESS STEEL
- AISI 316L as standard

ALLOY OR OTHER MATERIALS ARE AVAILABLE ON REQUEST

MATERIALS

GASKET in contact with media

- Klinger REINFORCED GRAPHITE type PSM (Single tang insert in 316) or for high pressure “PDM” (Double tang inserts in 316)
- PTFE and other material on request.

ORIGINAL GAUGE KLINGER GLASSES

- Extra-hard borosilicate glass, according to DIN 7081

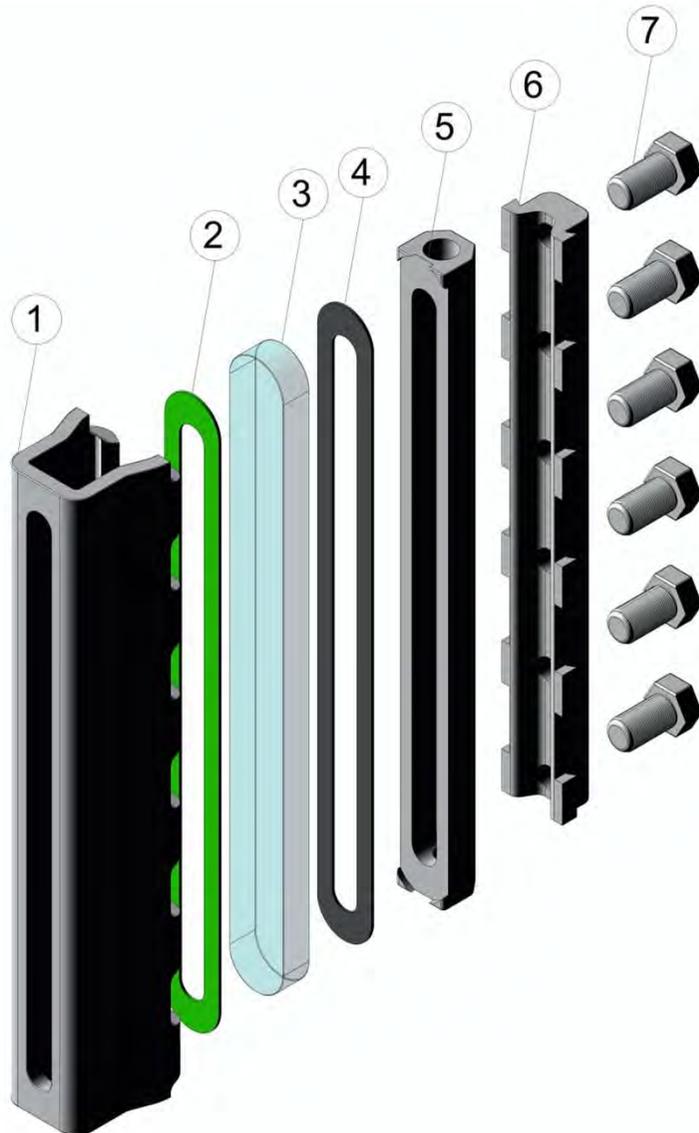
VALVE AND COCKS

- FS/H , M/H, M and other on request.



REFLEX LEVEL GAUGES

REFLEX Gauges suitable for STEAM and PROCESS applications



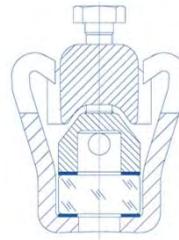
The Gauge Components:

- 1) Cover Piece
- 2) Cushion Gasket
- 3) Glass
- 4) Sealing Gasket
- 5) Gauge Body
- 6) Cover
- 7) Bolts

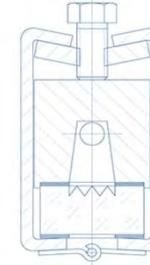
REFLEX MODELS

- **K** → PN40 / 32 Bar for steam
- **R25** → PN25
- **R50** → PN50 (NEW)
- **R100** → PN100
- **R160** → PN160
- **R250** → PN250
- **UWR** → PN100 (Weld-On)
- **USR** → PN100 (Weld-On)
- **UOR** → PN64 (Large Chamber)
- **A400** → PN 400
- **R-D** → PN16 (Glass Tube)

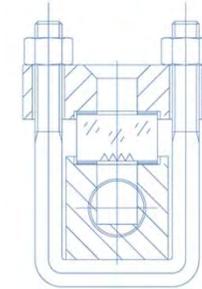
K



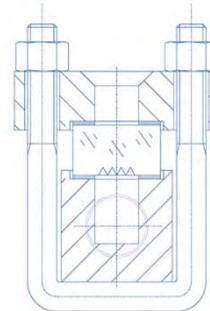
R25 / R50



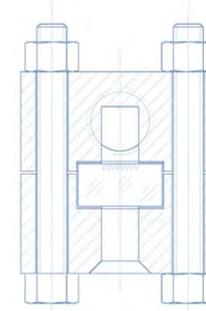
R100



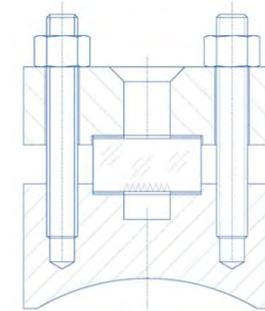
R160



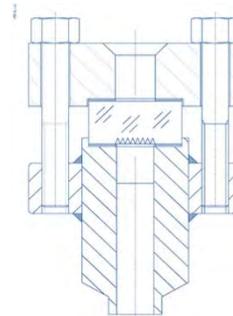
R250



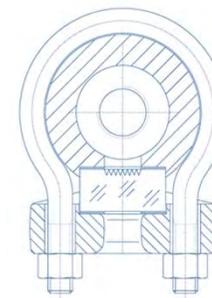
UWR



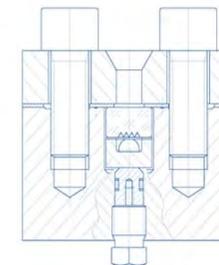
USR



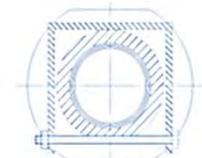
UOR



A400

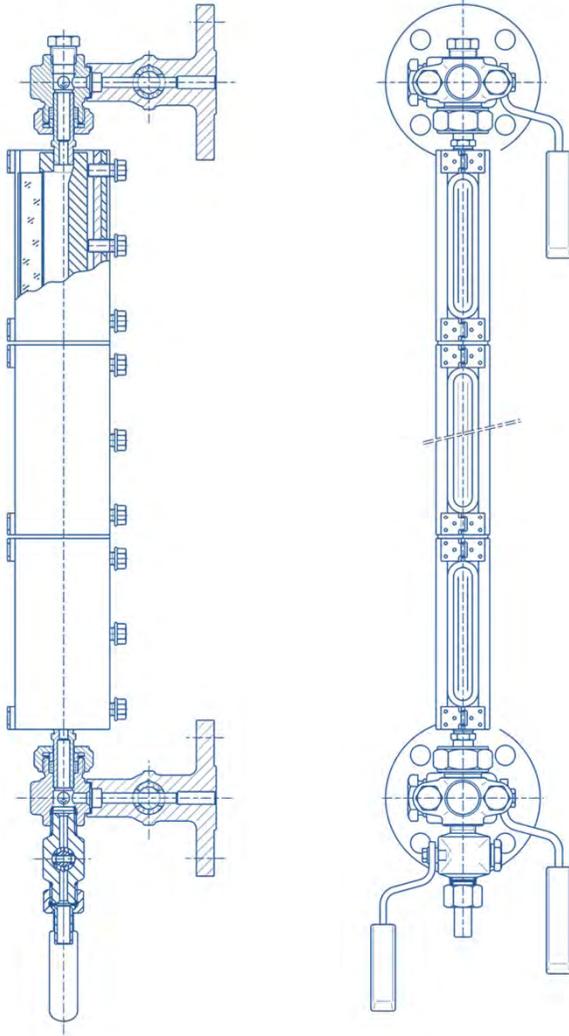


R-D



Reflex Level Gauges

For steam and process application



Reflex R25

Process: PN25/ANSI 150 T 400°C

Steam: Bar 20 - T 215°C

Material FS/H – M/H – Other on request

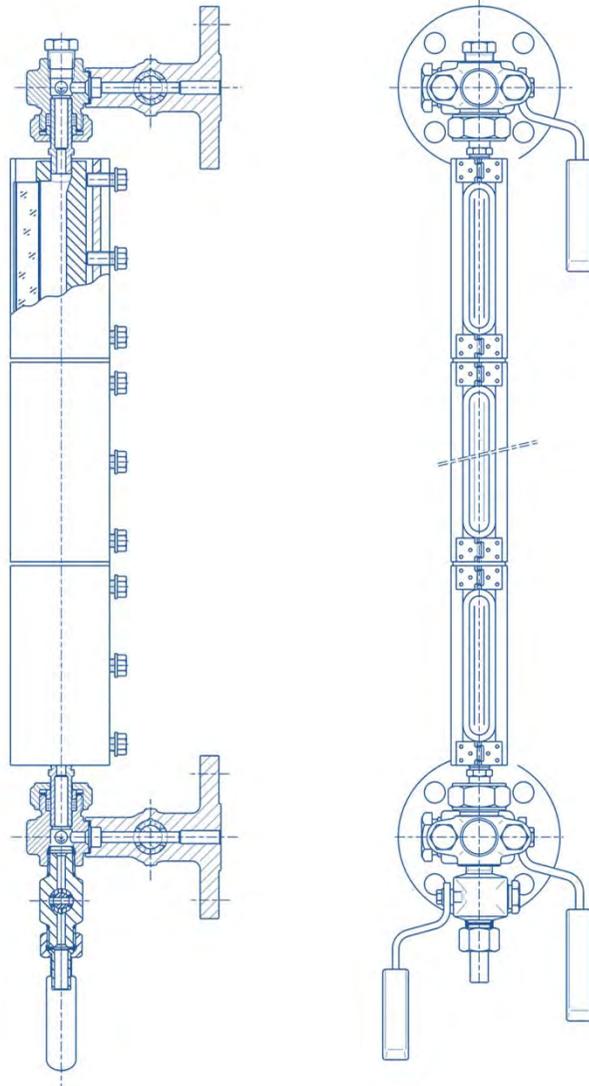
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- RAV 946/956 on Process

Reflex Level Gauges

For steam and process application



Reflex R50

Process: PN50/ANSI 300 T 400° C

Steam: Bar 20 - T 215° C

Material FS/H – M/H – M

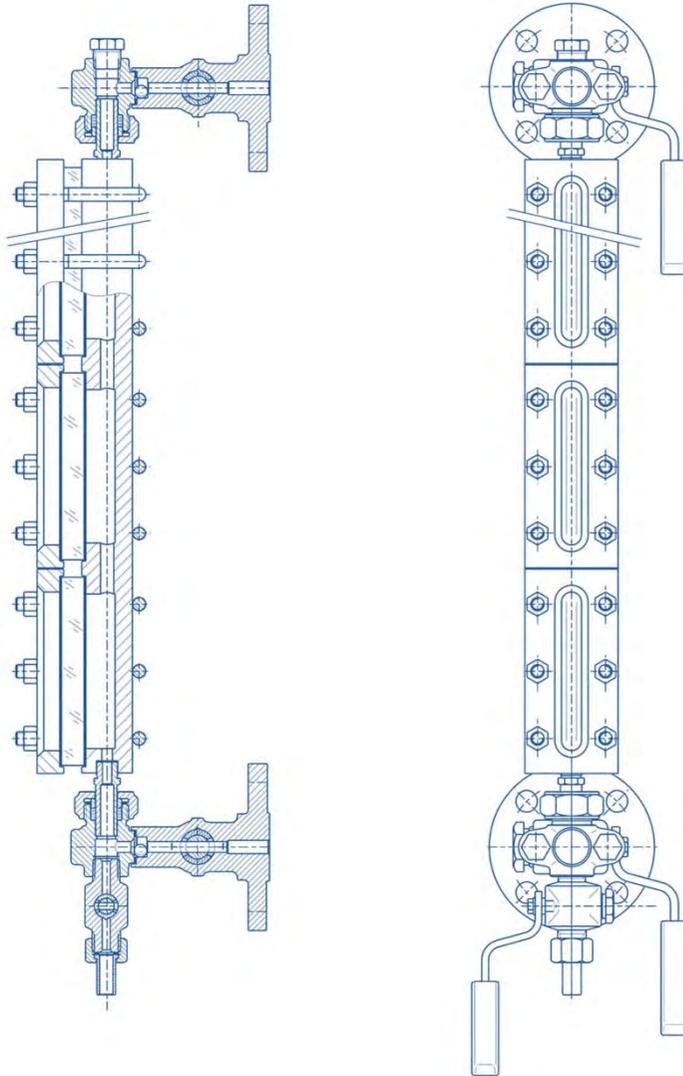
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- RAV 946/956 on Process

Reflex Level Gauges

For steam and process application



Reflex R100

Process: PN100/ANSI 600 T 400°C
Steam: Bar 22 - T 219°C

Material FS/H – M/H – M – Other on request

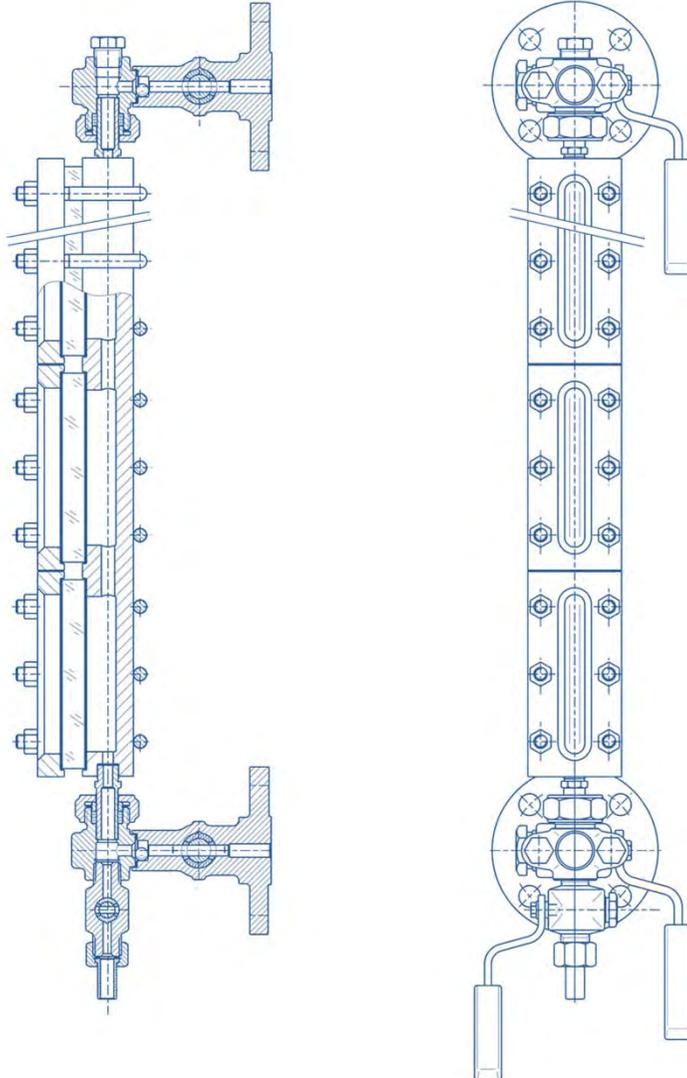
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- RAV 946/956 on Process

Reflex Level Gauges

For steam and process application



Reflex R160

Process: PN160/ANSI 900 T 400°C

Steam: Bar 32- T 239°C

Material FS/H – M/H – M – Other on request

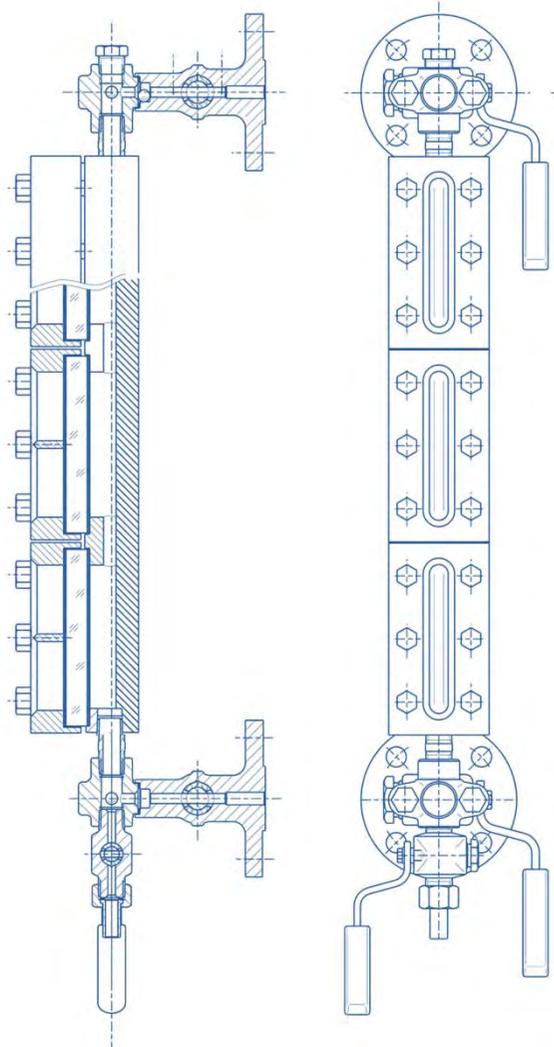
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- RAV 946/956 on Process

Reflex Level Gauges

For process application



Reflex R250

Process:
PN250/ANSI 1500
T 400°C

Material FS/H – M/H – M – Other on request

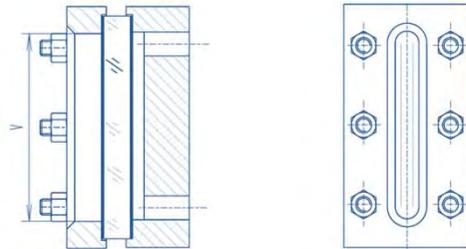
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- DG Cock on Process
- RAV 946/956 on Process

Reflex Level Gauges

For steam and process application

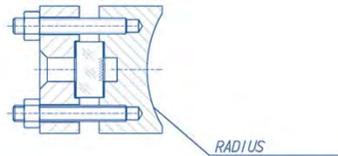


Reflex UWR - USR

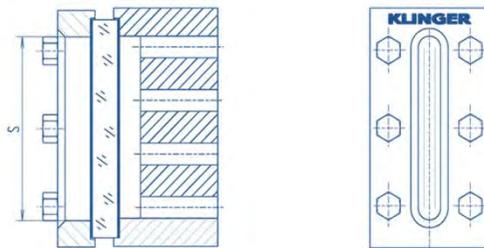
Direct welding on the tanks Radius back to be defined

Process: PN100/ANSI 600 T 400°C

Material FS/H – M/H – M – Others on request



Standard Sizes from I to IX
(Available with multiple sections too)

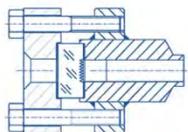


Also available:

UWR-A PN50

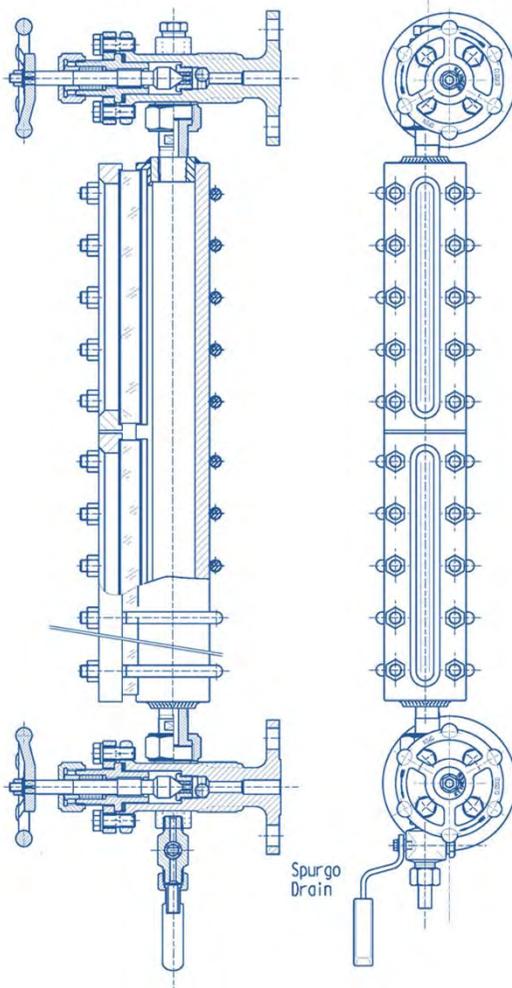
BODY 70x30 mm

GLASS "A"



Reflex Level Gauges

For process application



Reflex UOR

Large Chamber Internal Size:
about 40 mm

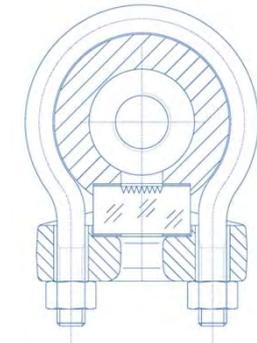
Process:
PN63/ANSI 400
T 400°C

Material FS/H – M/H - M

Standard Sizes from II to 7 x IX

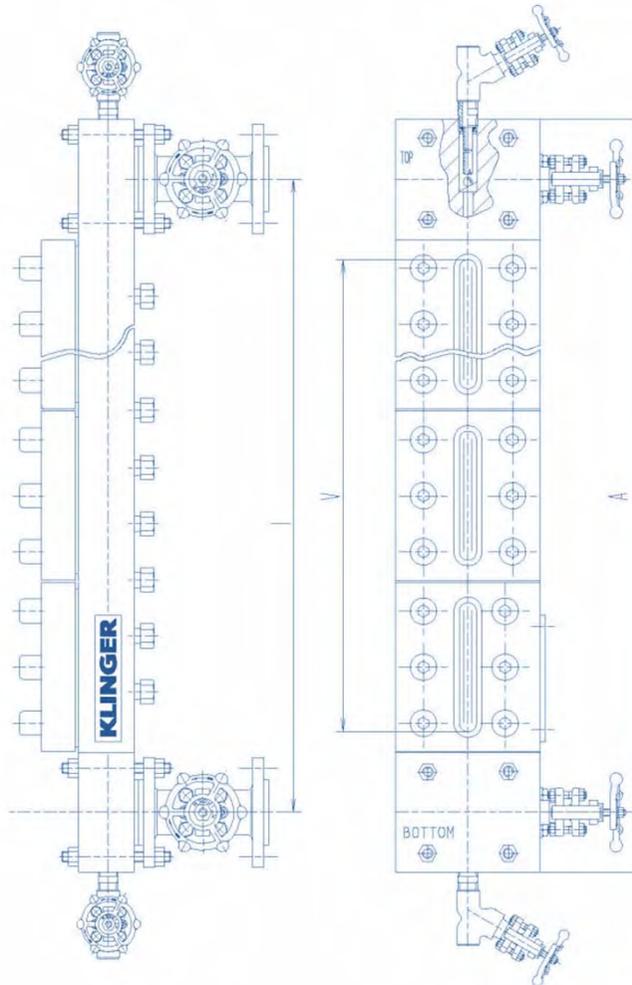
Suitable for shut-off Fittings:

- DG Cock on Process
- RAV 946/956 on Process



Reflex Level Gauges

For process application



Reflex A400

High Pressure

Process:
PN400/ANSI 2500
T 120° C

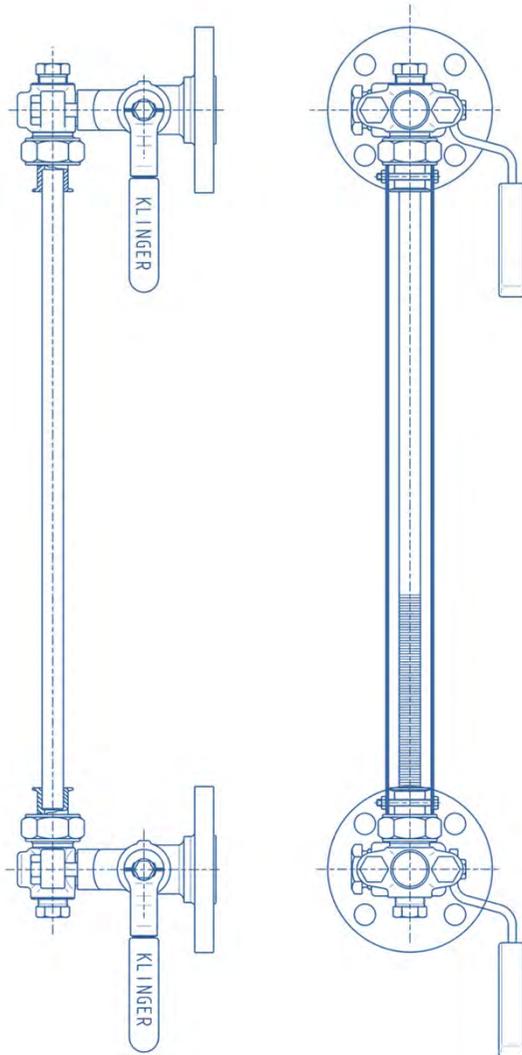
Material FS/H – M/H

Standard Sizes from II to 7 x IX

Suitable for shut-off Fittings:
- DVK-2 Valves

Reflex Level Gauges

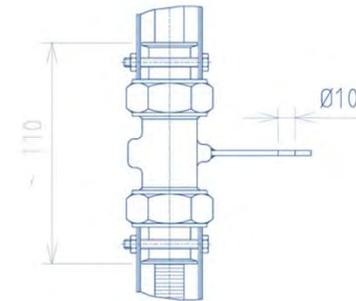
For steam and process applications



Glass Tube RD

Process:
PN 16 - T 185°C
Steam:
Bar 10 - T 120°C

Union piece



For Center to Center distance above
1500 mm union piece is suggested

Glass Tube protection in Carbon
Steel.

Material FS/H – M/H – M

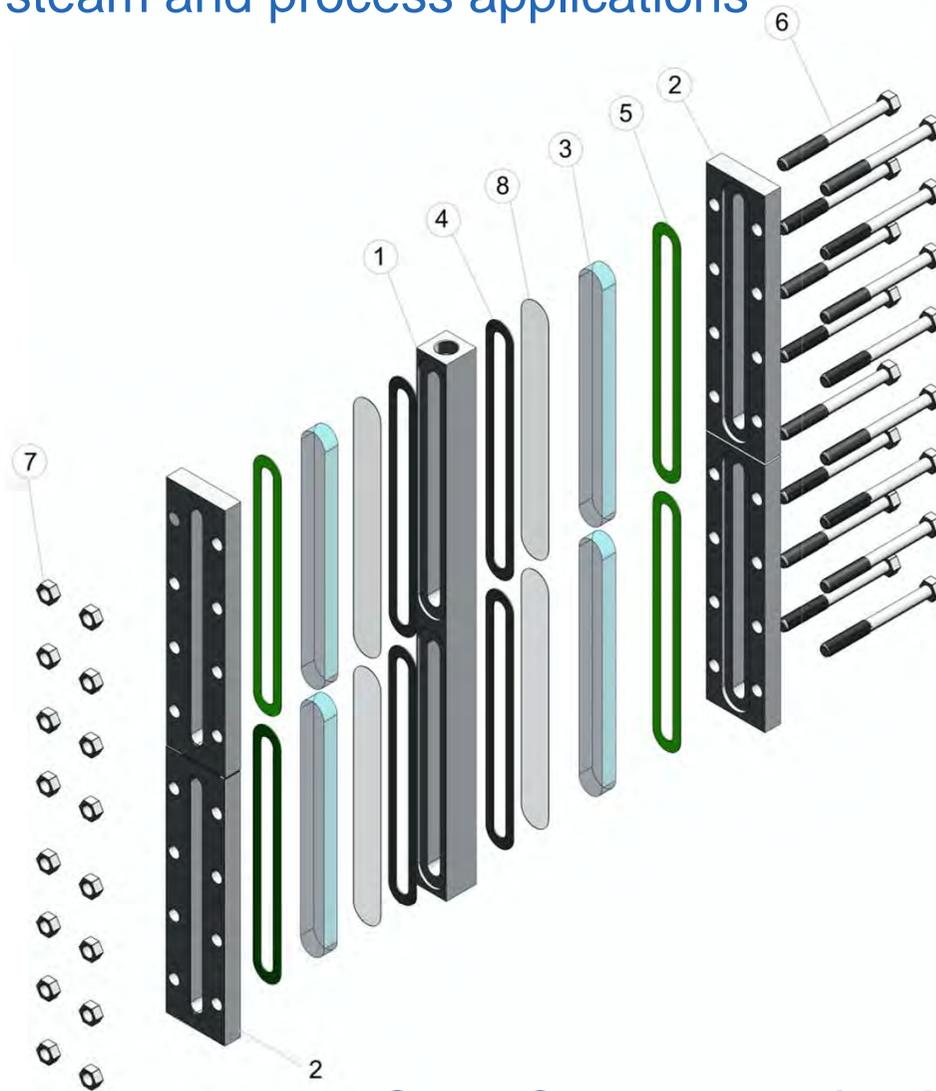
Suitable for shut-off Fittings:
- D Cock



TRANSPARENT LEVEL GAUGES

Trasparent Level Gauge

For steam and process applications

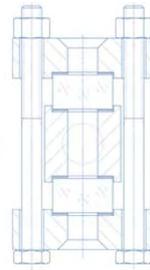


- 1) Centre Piece
- 2) Cover
- 3) Glass
- 4) Sealing Gasket
- 5) Cushion Gasket
- 6) Boltings
- 7) Nuts
- 8) Mica Shield (Optional)

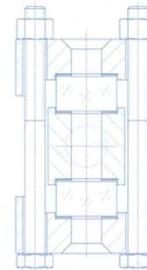
Same Components for the opposite side of the Gauge

- T50 PN50
- T100 PN100
- T160 PN160
- T250 PN250

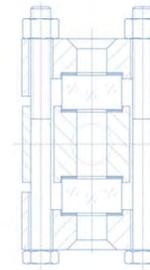
T50



T100



T160

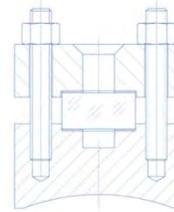


T250

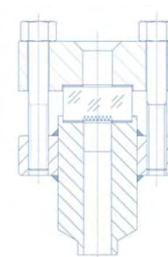


- UWT** PN100 ((Weld-On))
- UST** PN100 ((Weld-On))
- UOT** PN64 (Large Chamber)

UWT



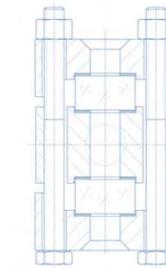
UST



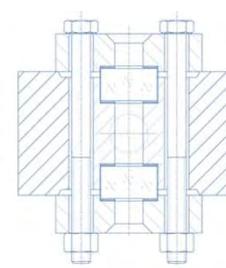
UOT



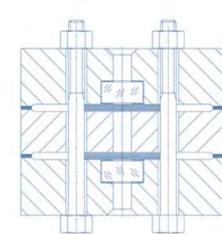
T160 XS



T85



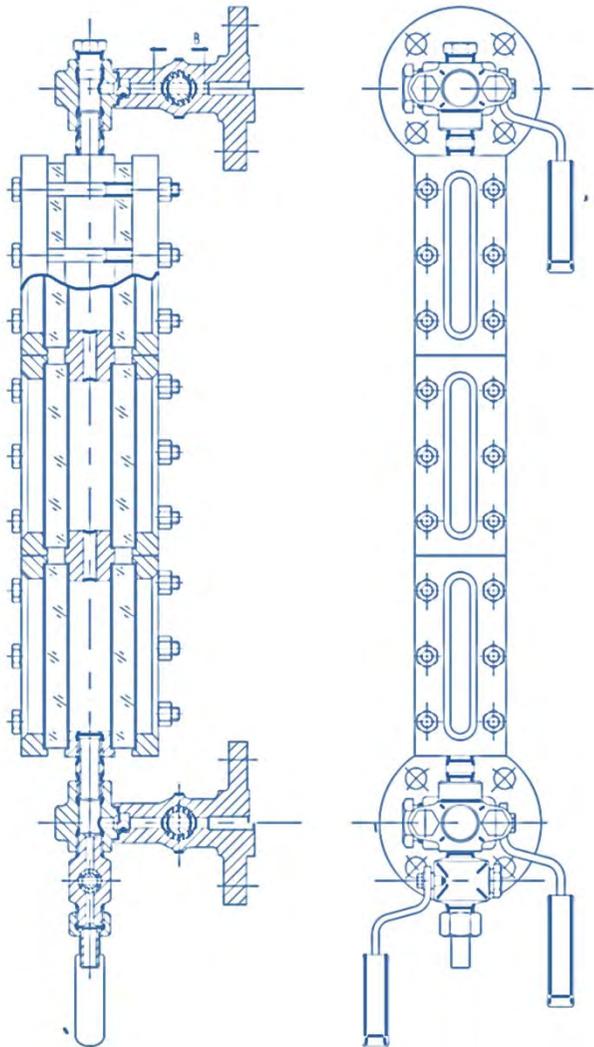
TA120



- T 160 XS Steam 60 Bar
- T 85 Steam 85 Bar
- TA 120 Steam 120 Bar

Transparent Level Gauge

For steam and process applications



TRASPARENT T50

Process: PN50/ANSI 300 T 400°C

Steam: Bar 15 T 202°C

Material FS/H – M/H – M – Other on request

Mica or Kel-F shields for glass protection

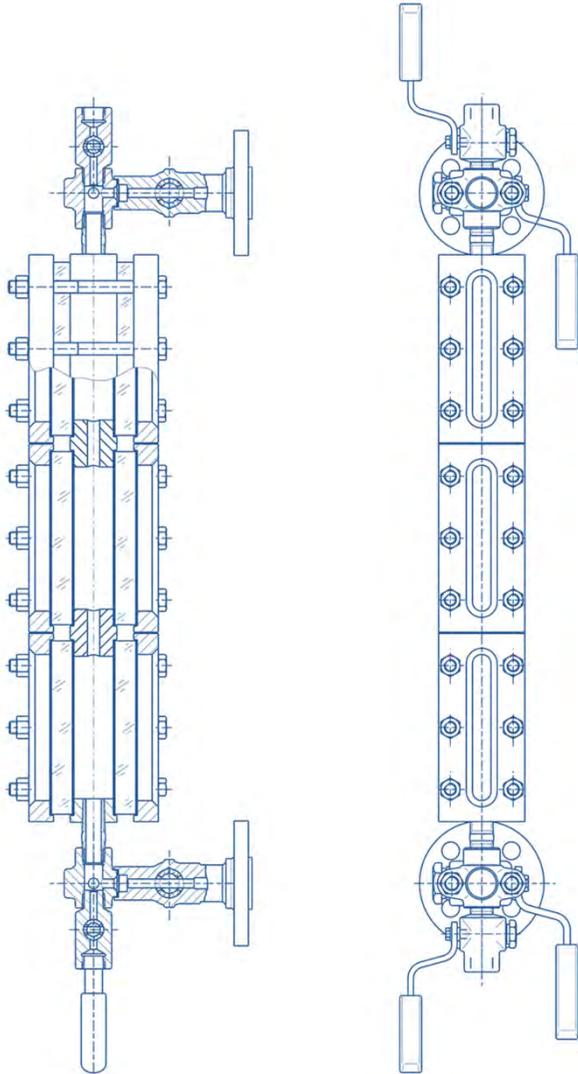
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- 946

Trasparent Level Gauge

For steam and process applications



TRASPARENT T100

Process: PN100/ANSI 600 T 400° C

Steam: Bar 30 T 235° C

Material FS/H – M/H – M – Other on request

Mica or Kel-F shields for glass protection

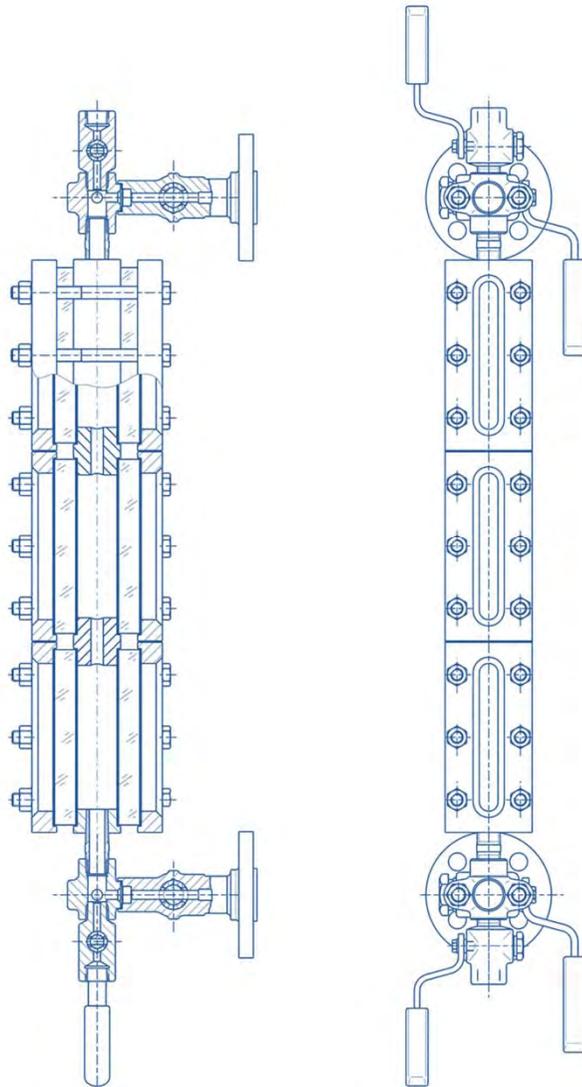
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- RAV 946/956 on Process

Trasparent Level Gauge

For steam and process applications



TRASPARENT T160

Process:

PN160/ANSI 900 T 400° C

Steam:

Bar 40 T 252° C

Material FS/H – M/H – M –
Other on request

Mica or Kel-F shields for glass protection

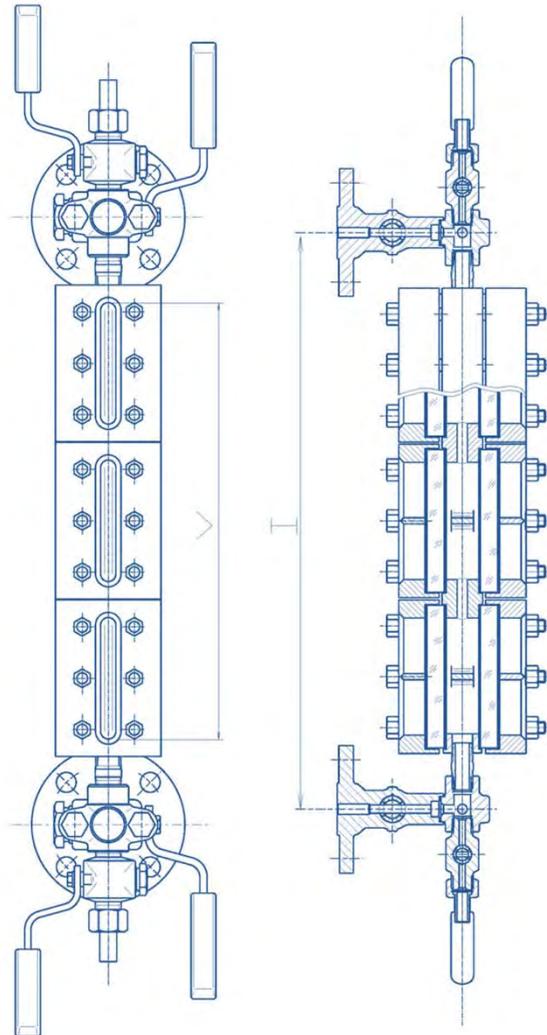
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- D Cock on Steam
- DG Cock on Process
- RAV 946/956 on Process

Trasparent Level Gauge

For process applications



TRASPARENT T250

High Pressure

Process: PN250/ANSI 1500 T 400°C

Material FS/H – M/H – M – Other on request

Mica or Kel-F shields for glass protection

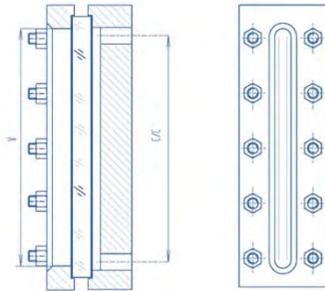
Standard Sizes from I to 7 x IX

Suitable for shut-off Fittings:

- DG Cock on Process
- RAV 946/956 on Process

Transparent Level Gauge

For process applications



TRANSPARENT UWT - UST

Direct welding to the tanks Radius back to be defined

Process: PN100/ANSI 600 T 400°C

Material FS/H – M/H – M – Others on request

Standard Sizes from I to IX
(Available with multiple sections too)

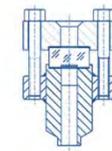
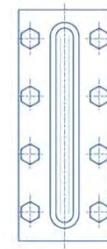
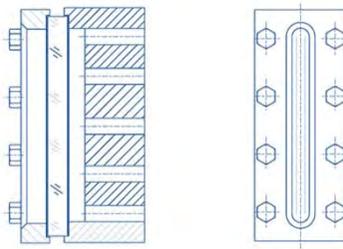
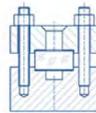
Mica or Kel-F shields for glass protection

Also available

UWT-A PN50

BODY 70x30 mm

GLASS "A"



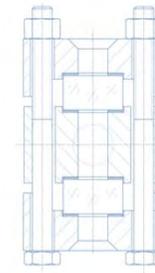
Trasparent Level Gauge

Only for steam applications



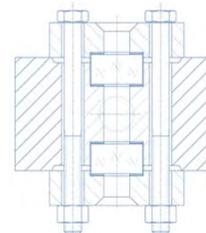
- **T 160 XS**
Steam 60 Bar

T160 XS



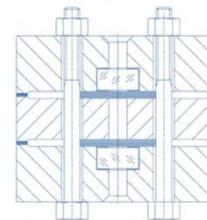
- **T 85**
Steam 85 Bar

T 85



- **TA 120**
Steam 120 Bar

TA120



Trasparent Level Gauge

Only for steam applications



TRASPARENT T160-XS

Medium Pressure

Material: FS/H

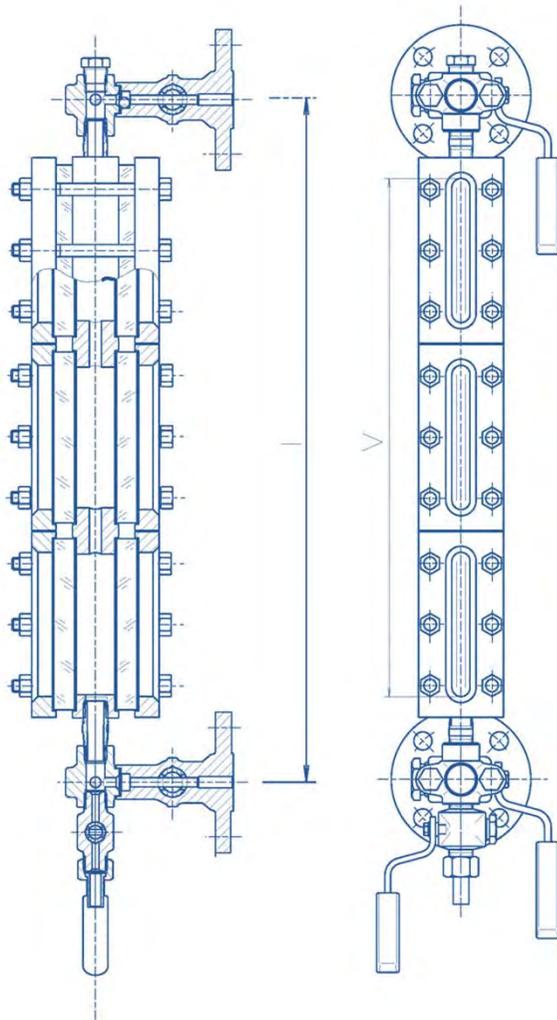
Mica shields

Standard Sizes: from I to 7 x IX

Back Illuminator on request

Suitable for shut-off Fittings:

- D Cock up to 40 Bar
- DA Cock up to 60 Bar
- RAV 957 seal welded up to 60 Bar



Trasparent Level Gauge

Only for steam applications



TRASPARENT T85

High Pressure

Steam: 85 Bar / T 298°C

Material: FS/H

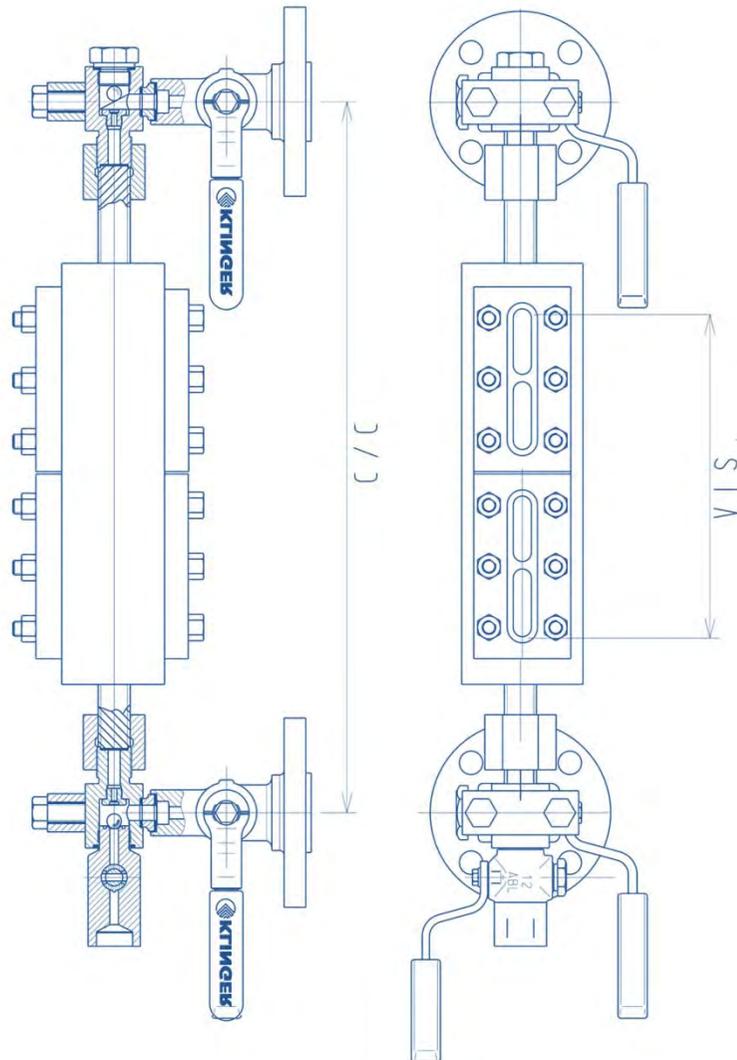
Mica shields

Standard Sizes: from II to 7 x IX

Back Illuminator on request

Suitable for shut-off Fittings:

- DA Cock
- RAV 957 seal welded
- DVK-2



Trasparent Level Gauge

Only for steam applications



TRASPARENT TA120

High Pressure

Steam: 120 Bar / T 323° C

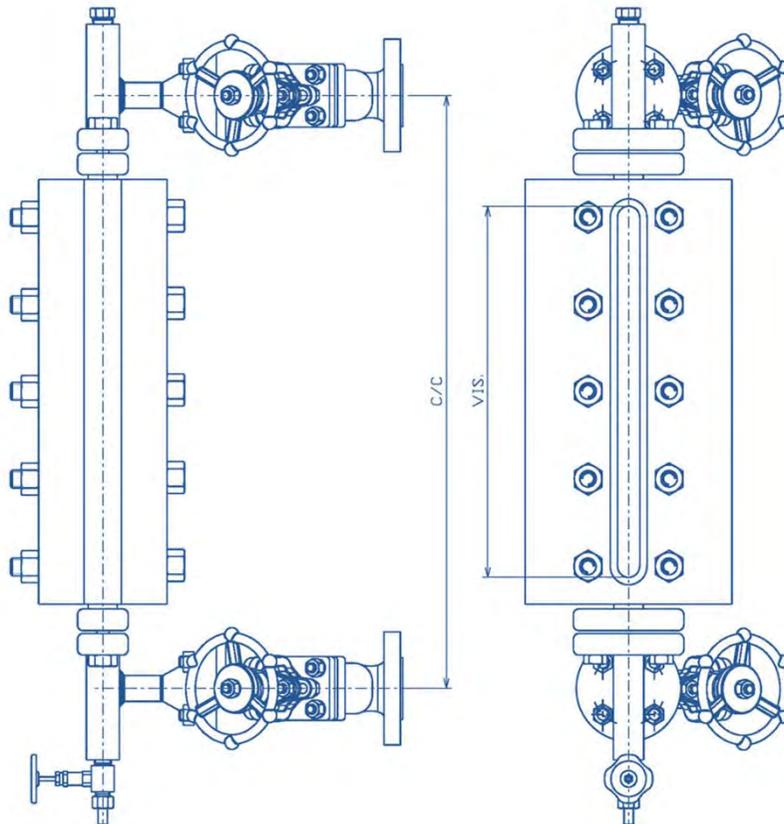
Material: FS/H

Mica shields

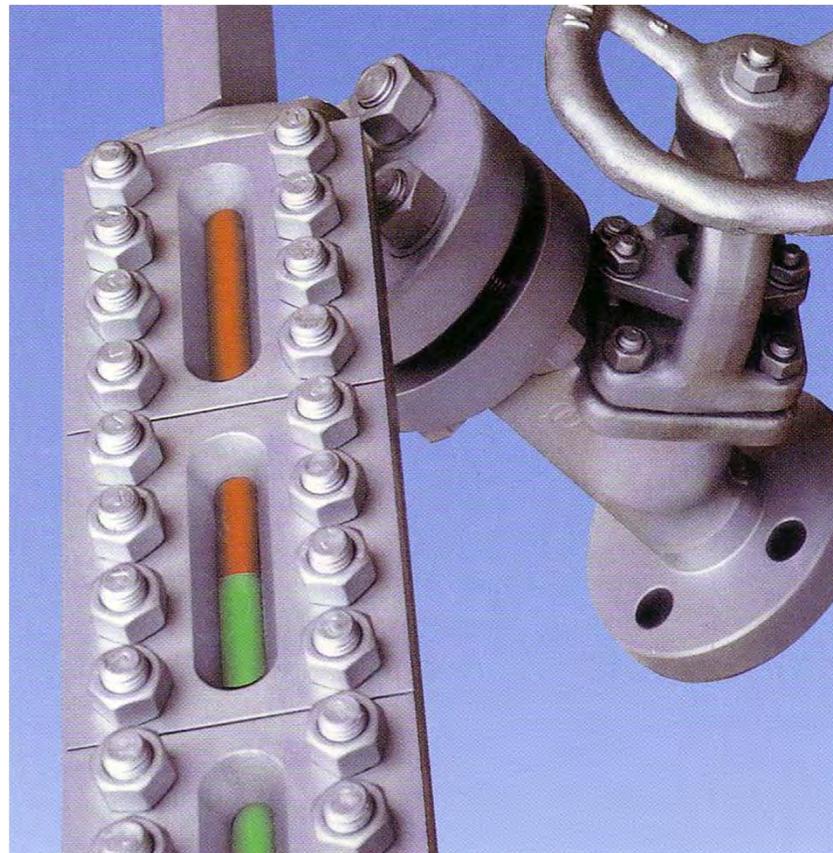
Standard Sizes from III to IX

Back Illuminator on request

Suitable for shut-off Fittings:
- DVK-2



BICOLOUR LEVEL GAUGES

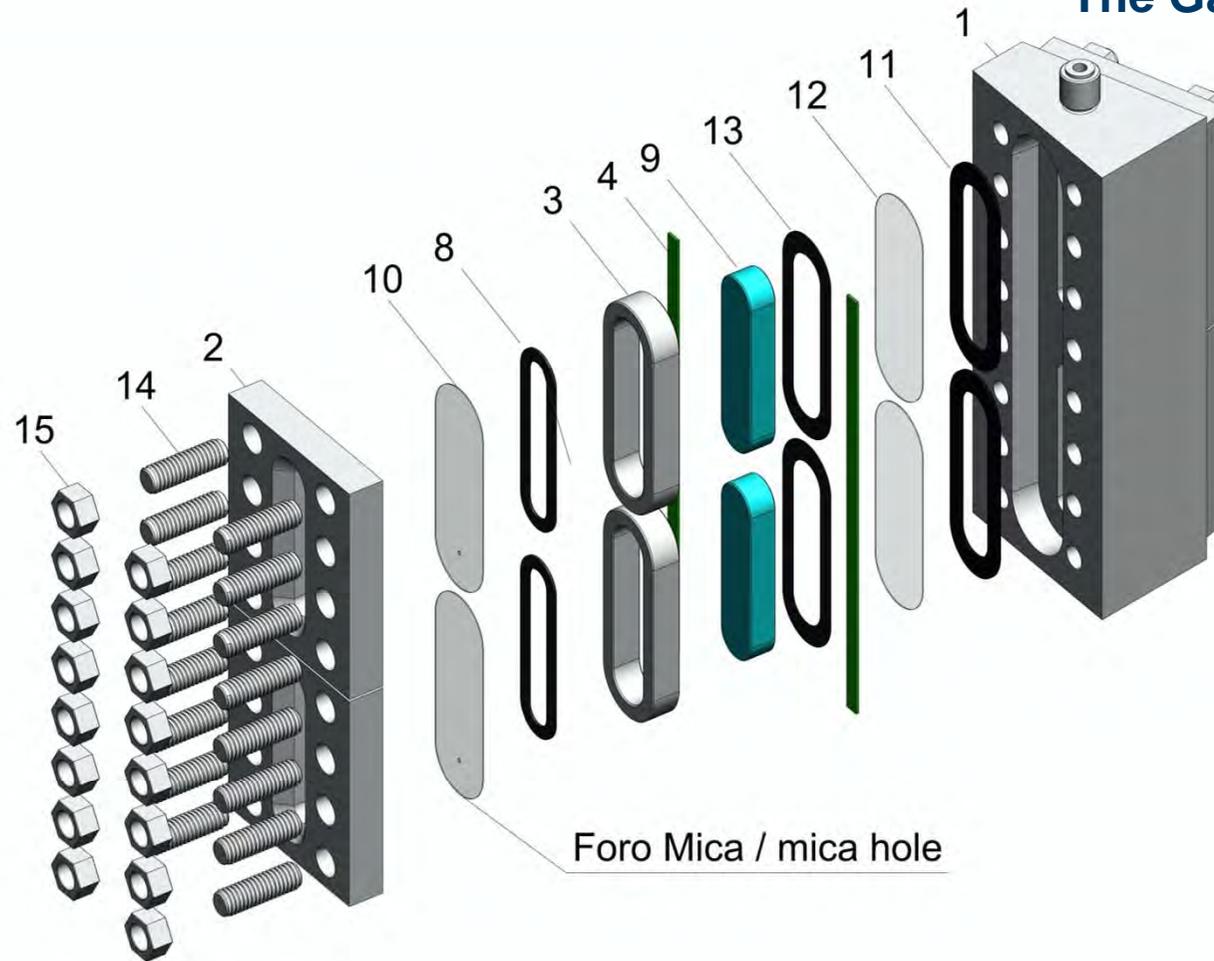


Becolour Level Gauge

For steam application



The Gauge Components

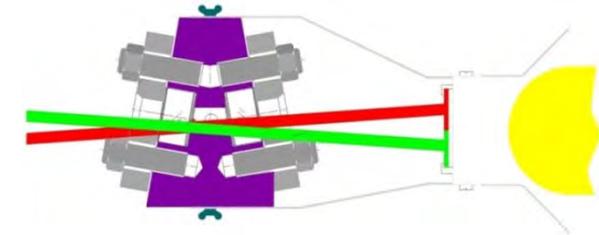


- 1) Centre pieces
- 2) Cover plate
- 3) Glass Holder
- 4) Spacer strip
- 9) Gauge glass
- 8) Mica Shield
- 10) Cushion Gasket
- 11) Sealing Gasket
- 12) Glass Protector
- 13) Mica protector
- 14) Stud bolt
- 15) Hexagon nuts

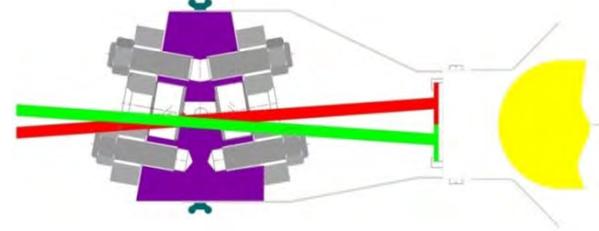
Same Components for the opposite side of the Gauge

BICOLOUR LEVEL GAUGES

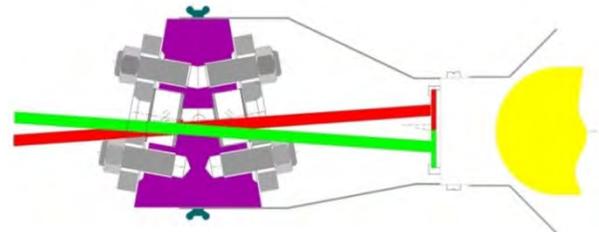
KTA 225 up to 225 Bar Steam



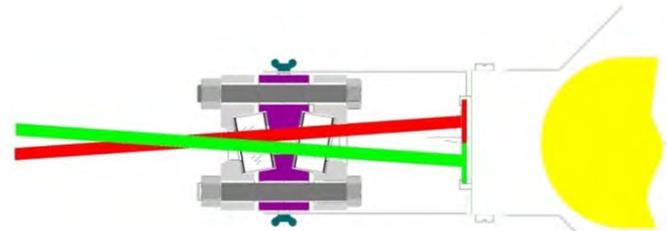
KTA 180 up to 180 Bar Steam



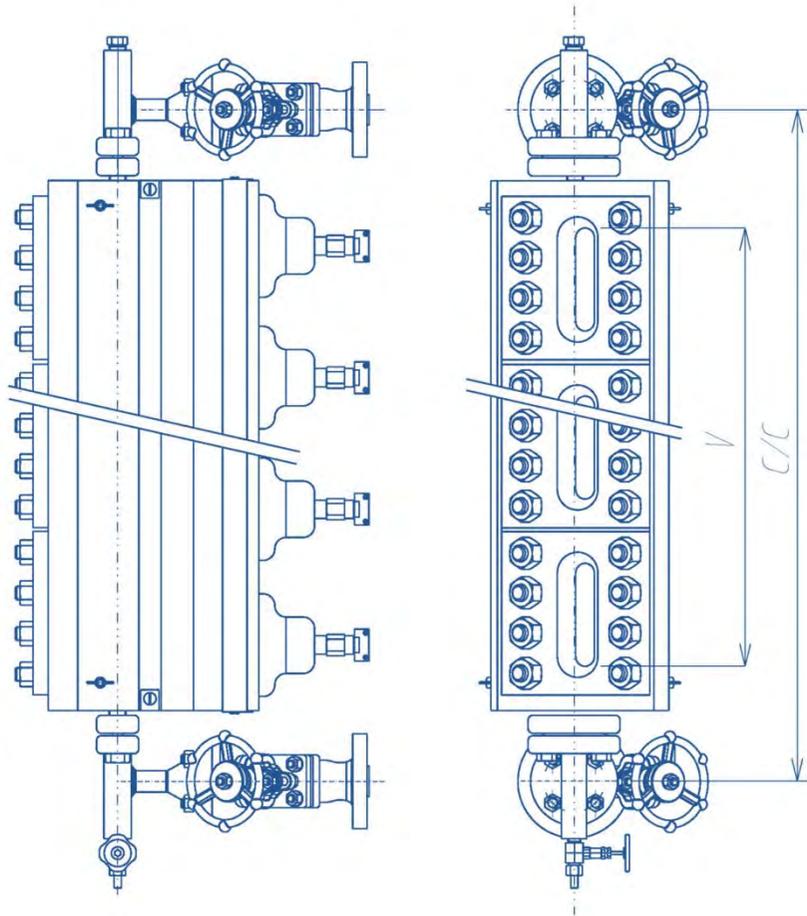
KT 75 up to 75 Bar Steam



KT 25 up to 25 Bar Steam



Bicolour Level Gauge



High Pressure Steam

Up to 225 Bar

Material Carbon Steel (FS/H)

Mica shields

Back illuminator

Single Size I (VIS = 93 mm)

Multiple Sections available

Suitable for shut-off fittings:

- for KTA 180 & KTA 225: DVK-2
- for KT 75: DVK-2 or DA
- for KT 25: DA or D

BICOLOUR MODEL

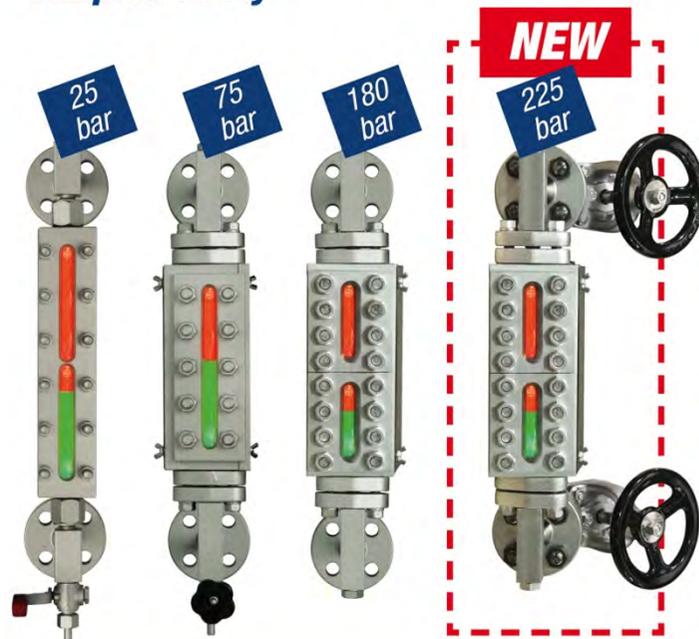


Top
of the world

Bicolour
level gauges
for high pressure
steam application



Complete family



A COMPLETE FAMILY
Designed in Klinger Italy Srl

| | |
|----------------|----------------------------|
| KTA 225 | up to 225 bar Steam |
| KTA 180 | up to 180 bar Steam |
| KT 75 | up to 75 bar Steam |
| KT 25 | up to 25 bar Steam |



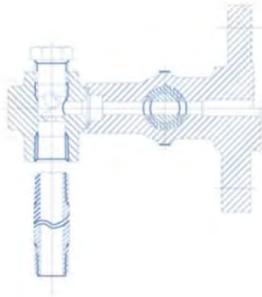
VALVES & COCKS

VALVES & COCKS

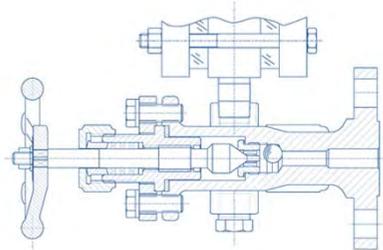


PROCESS

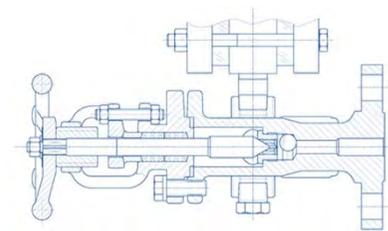
DG



RAV 946

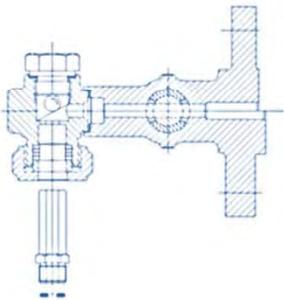


RAV 956

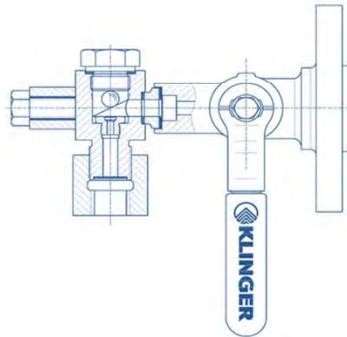


STEAM

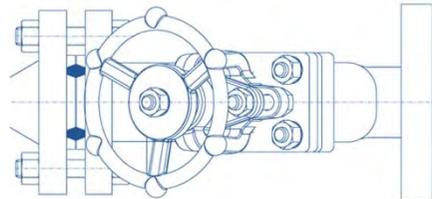
D



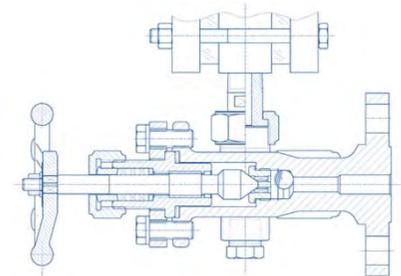
DA



DVK-2

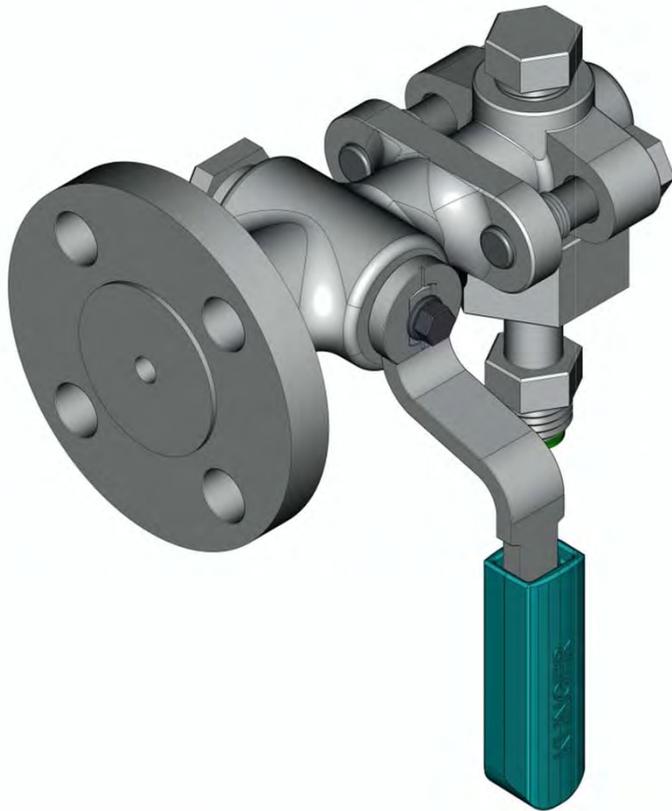


RAV 947/957



GAUGE COCK D

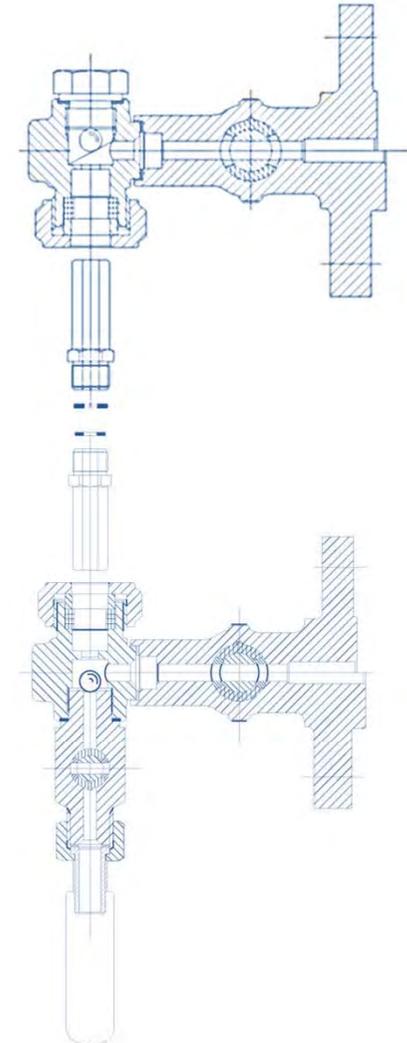
Steam Application PN 64 / ANSI 400



Graphite Sealing with
Klinger soft packing Sleeve

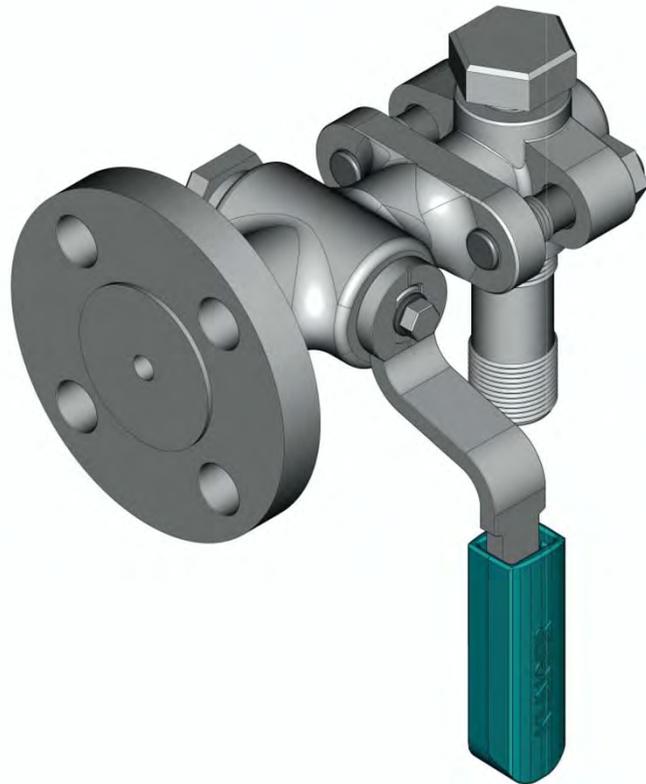
Vessel Connection:
flange or NPT

Connection to Gauge:
- End tube 16 mm
- ROTATABLE



GAUGE COCK DG

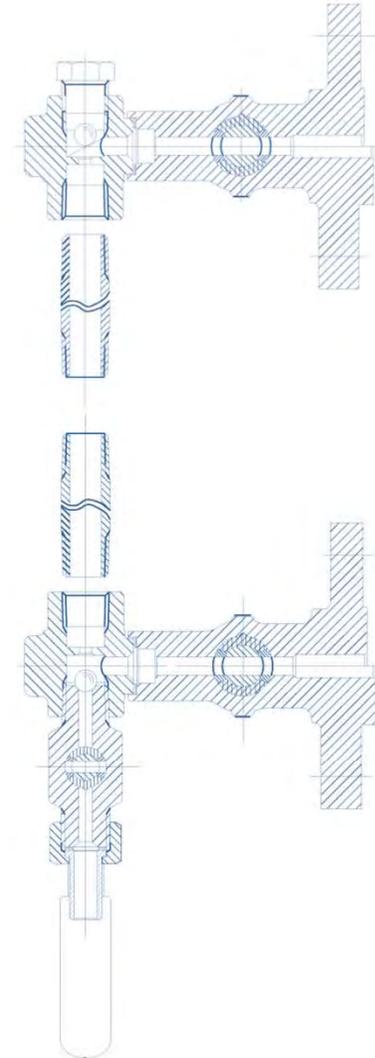
Process Application PN 160 / ANSI 900



Graphite Sealing with
Klinger soft packing
Sleeve

Vessel Connection:
Flange or NPT

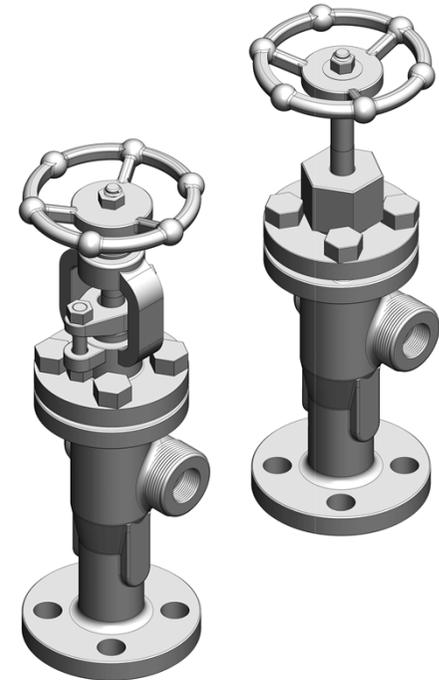
Connection to Gauge:
- 1/2" NPT (3/4" Option) -
NOT ROTATABLE



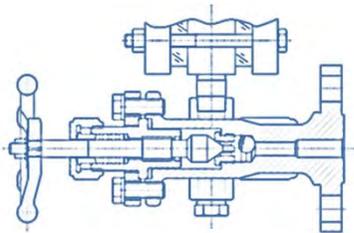
GAUDE COCK RAV  **RAV 946**
RAV 956

Process and steam Applications
PN 250 / ANSI 1500

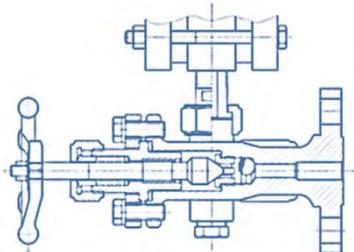
OFF-SET - Metal Seated Valve Safety Ball
Vessel Connection: Flange- NPT-SW-BW
Connection to Gauge 1/2" NPT (3/4" Option)



Inside Screw

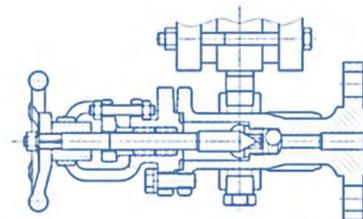


RAV 946

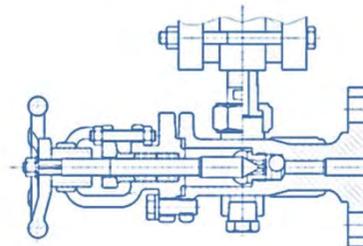


RAV 947

Outside Screw

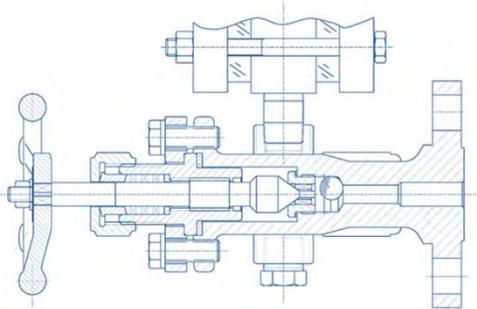


RAV 956

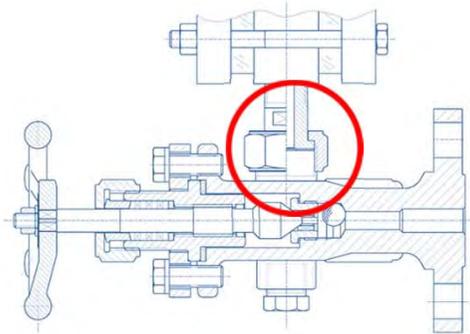


RAV 957

RAV 946

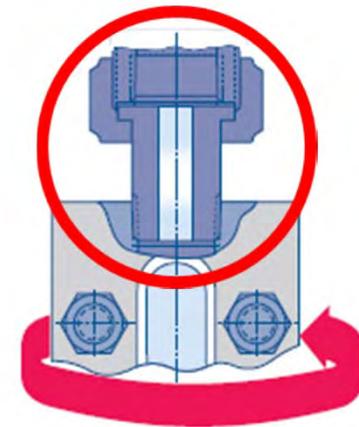


RAV 947

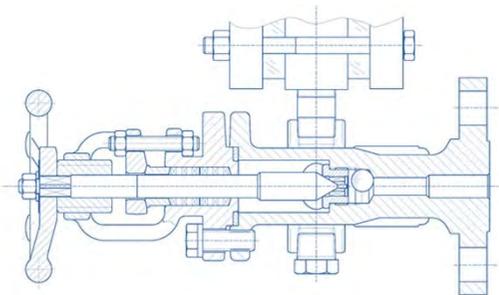


RAV 9.....6
Final Digit 6
Plain Nipple to Gauge
(NOT ROTATABLE)

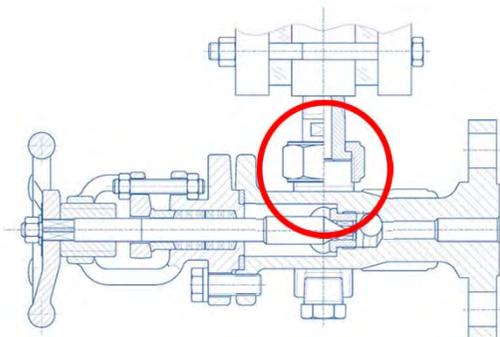
RAV7
Final Digit 7
Union Nipple to Gauge
(ROTATABLE)



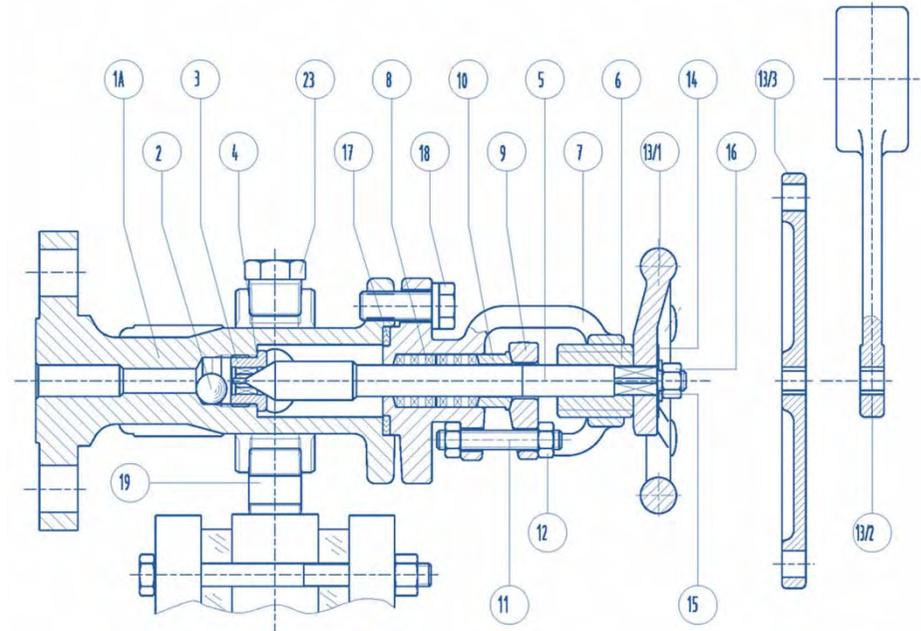
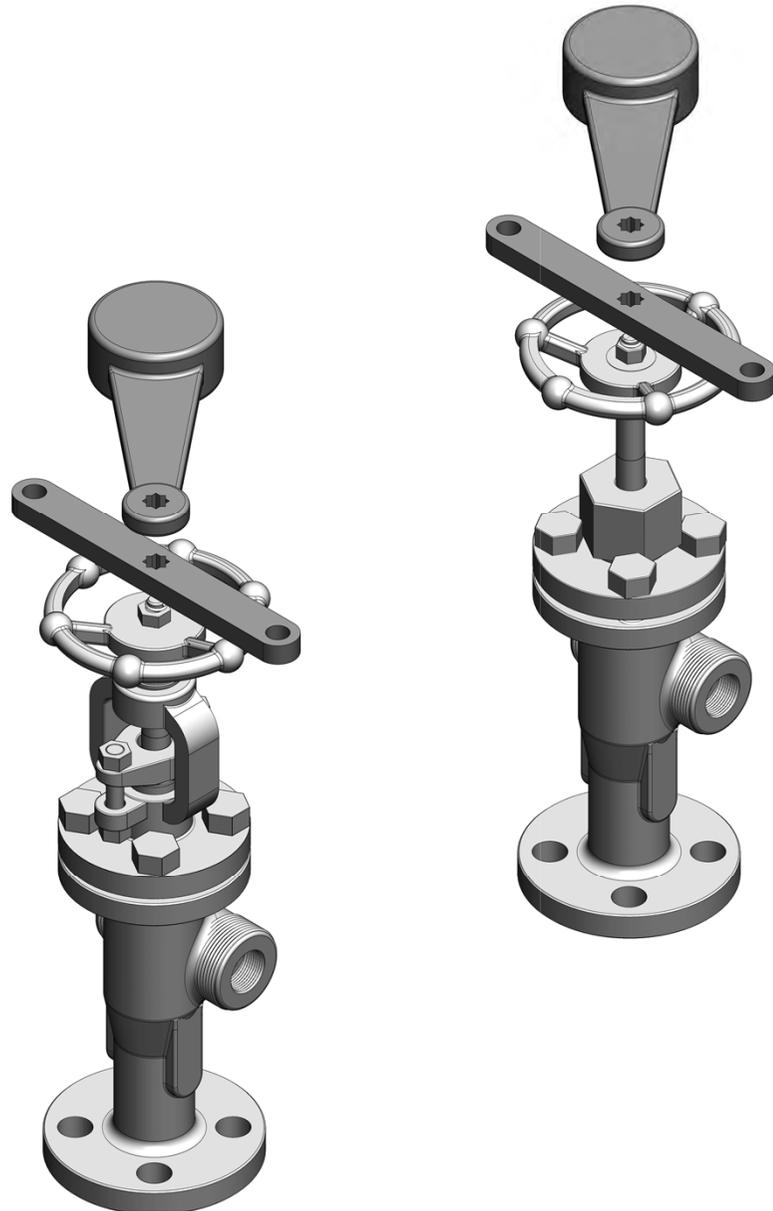
RAV 956



RAV 957



GAUGE COCK RAV 946 / 956 WITH OPTIONAL



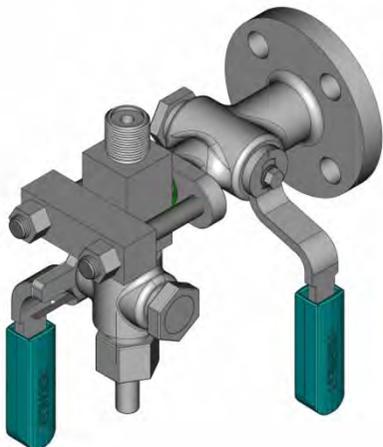
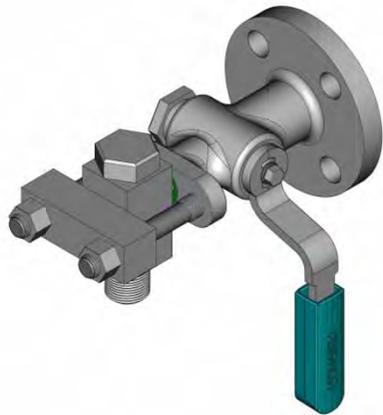
Shut-off operation

- Standard handwheel (/ 1)
- Weighted lever (/ 2)
- Double ended lever (/ 3)
- Quick closing handwheel (/ 5)

GAUGE COCK DA

Steam Application PN 160 / ANSI 900

For high pressure steam service

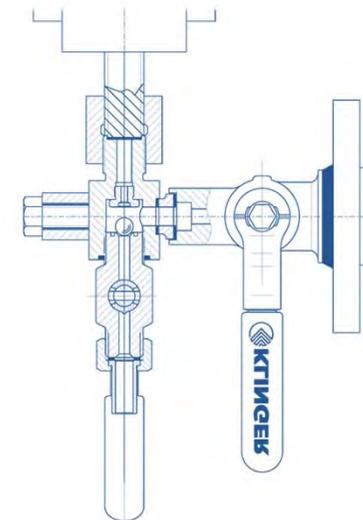
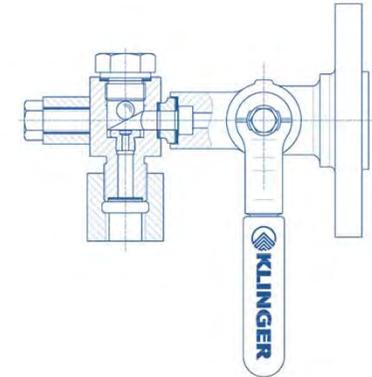


Graphite Sealing with
Klinger soft packing Sleeve

Vessel Connection:
Flange or NPT

Connection to Gauge:
- 5/8" MALE (left thread)

- ROTATABLE



DVK2

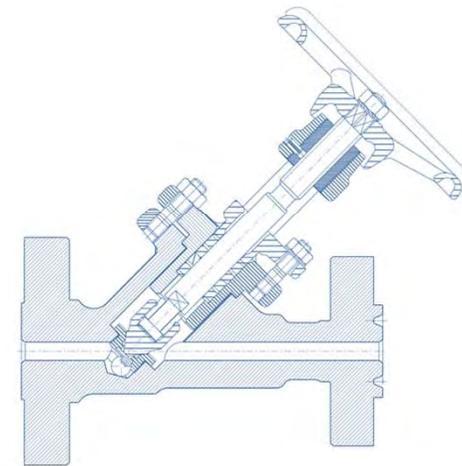
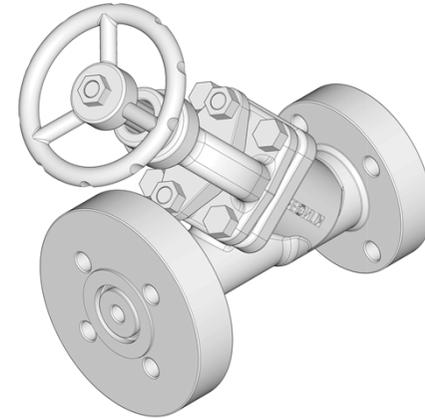
Steam Application PN 320 / 225 Bar

For high pressure steam service
suitable for Bicolour KTA180, KTA 225
and Transparent T85 and TA120.

Vessel Connection Flanged – SW - BW

Special execution available

Always with the connecting piece



AB 12 – 18 (L) COCKS

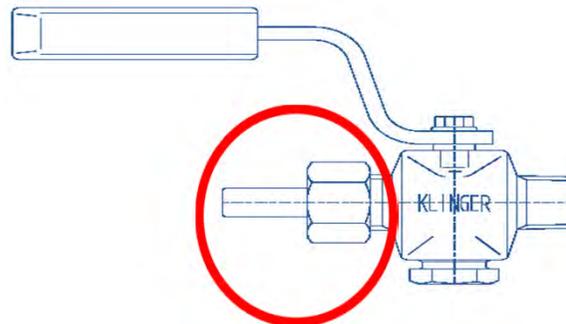
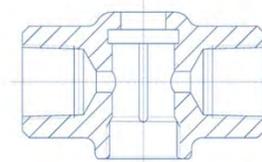
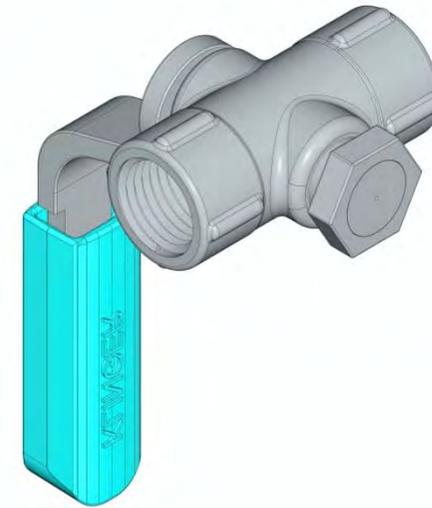
Drain & Vent Valves

Soft Sealed Cock

- Klinger Packing Sleeve in Graphite (PTFE Option)
- PN 160 / ANSI 900
- Materials FS/H – M/H – M

Connection: 1/2" - AB12
Option 3/4" - AB18

Tail pipe for code "L"



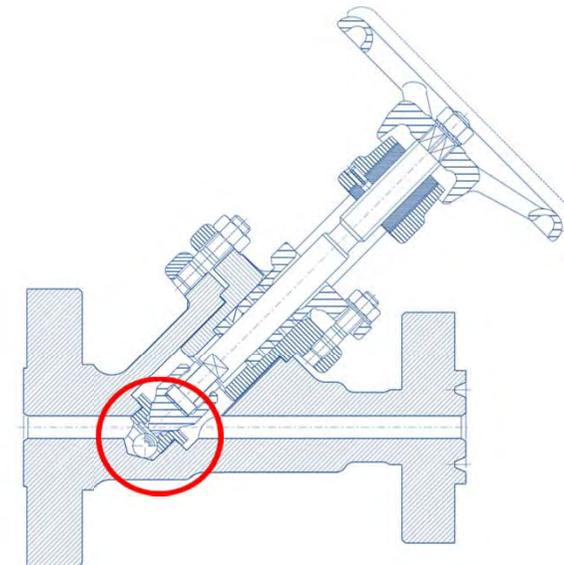
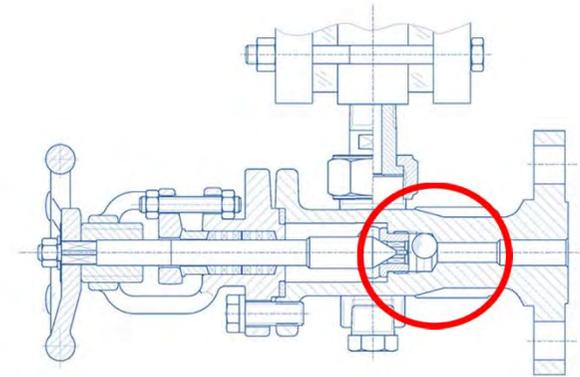
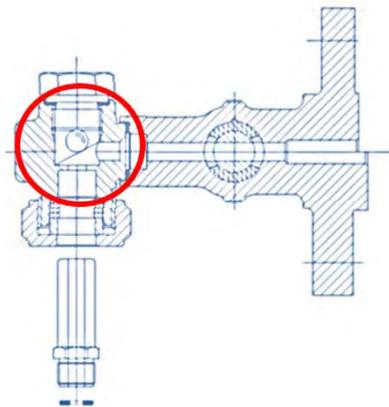
Safety Balls



Safety Balls or Ball Check

Safety device stopping the leakage in the event of glass breakage.

If glass is damaged, due to the vacuum created by the leakage into the gauge body, the safety balls are moving against the seats and isolate the gauge by the tank, stopping the leakage.



LEVEL GAUGES CONFIGURATIONS

Level gauges configurations:

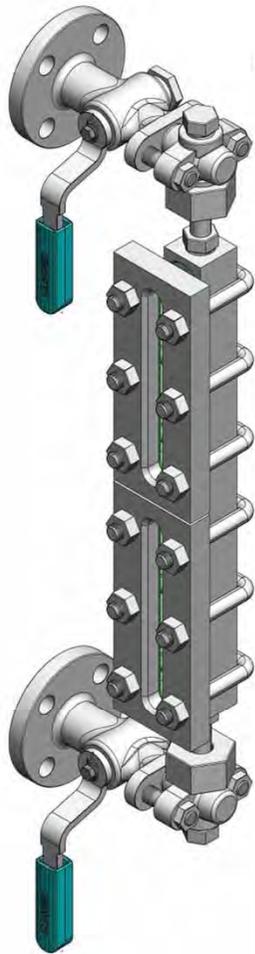
Top & Bottom

vessel connection to back (code A1)

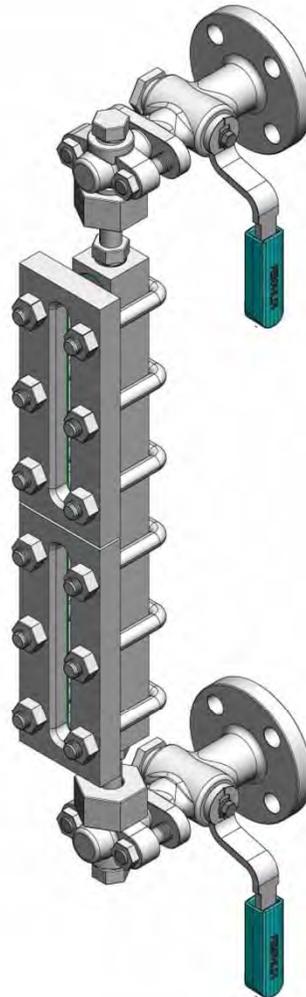
vessel connection to left (code A2)

vessel connection to right (code A3)

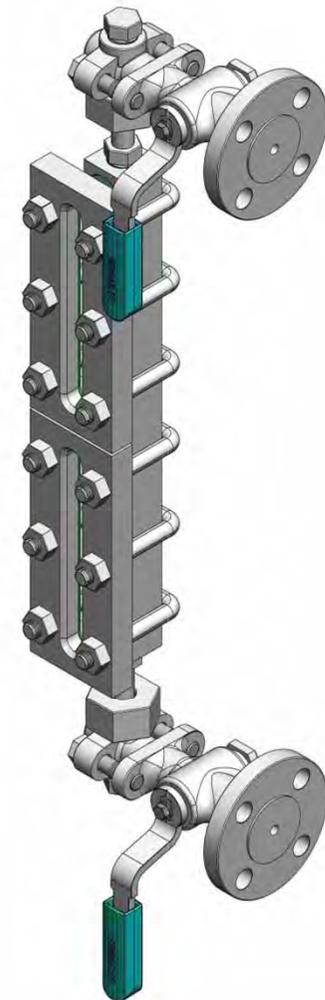
CONF. A2



CONF. A1



CONF. A3



Level gauges configurations:

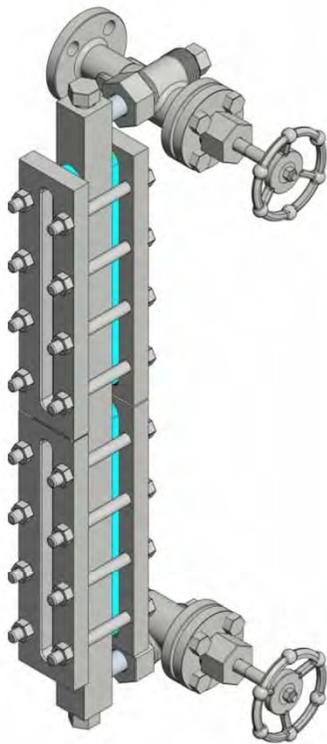
Side Side

vessel connection to back (code A1)

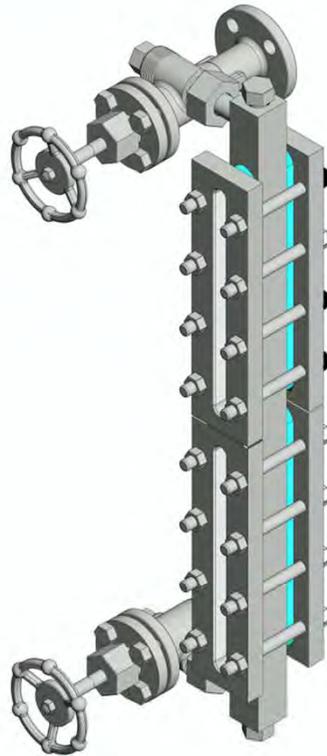
vessel connection to left (code A2)

vessel connection to right (code A3)

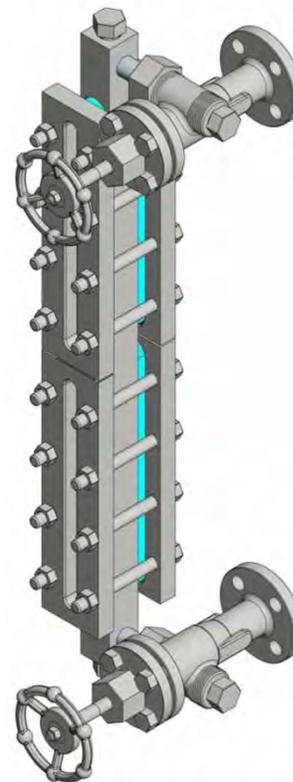
CONFIGURATION
SIDE SIDE BACK
CONNECTION **A2**
(TO LEFT)



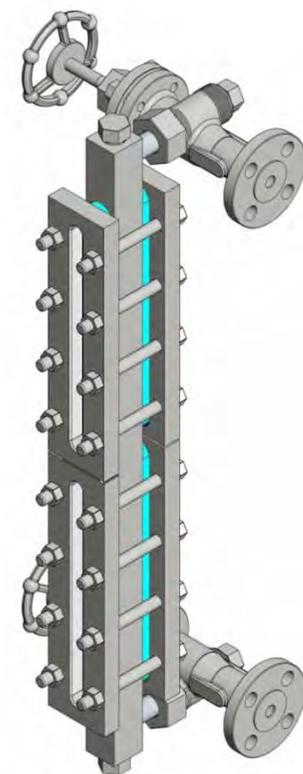
CONFIGURATION
SIDE SIDE LEFT
CONNECTION **A1**
(TO BACK)



CONFIGURATION
SIDE SIDE RIGHT
CONNECTION **A1**
(TO BACK)



CONFIGURATION
SIDE SIDE BACK
CONNECTION **A3**
(TO RIGHT)





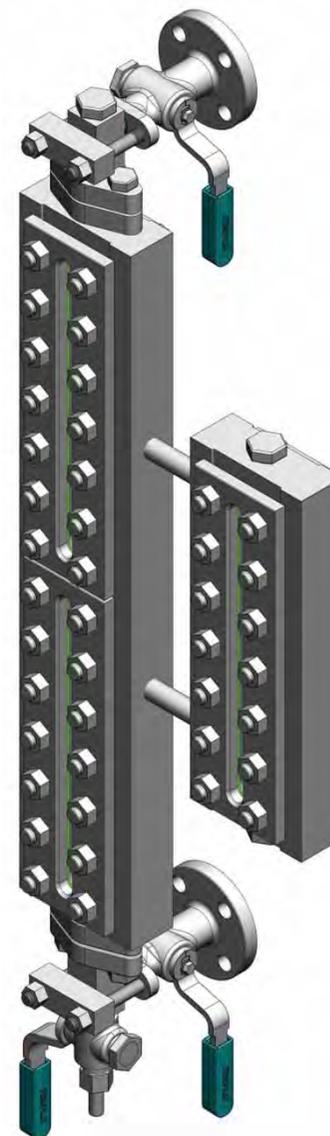
SPECIAL GAUGES

SPECIAL GAUGES

With special execution



BY PASS (UNINTERRUPTED VIS.)

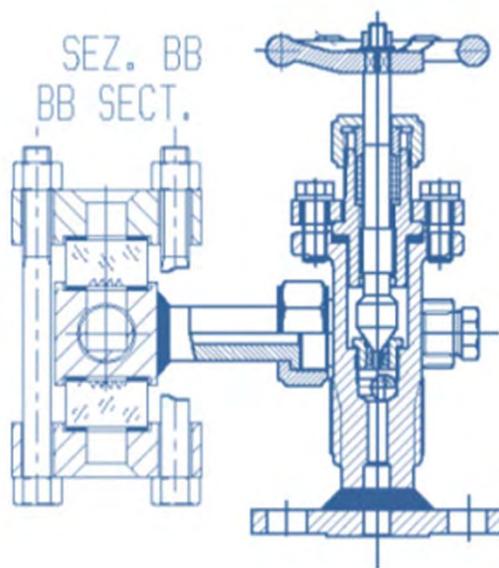


SPECIAL GAUGES

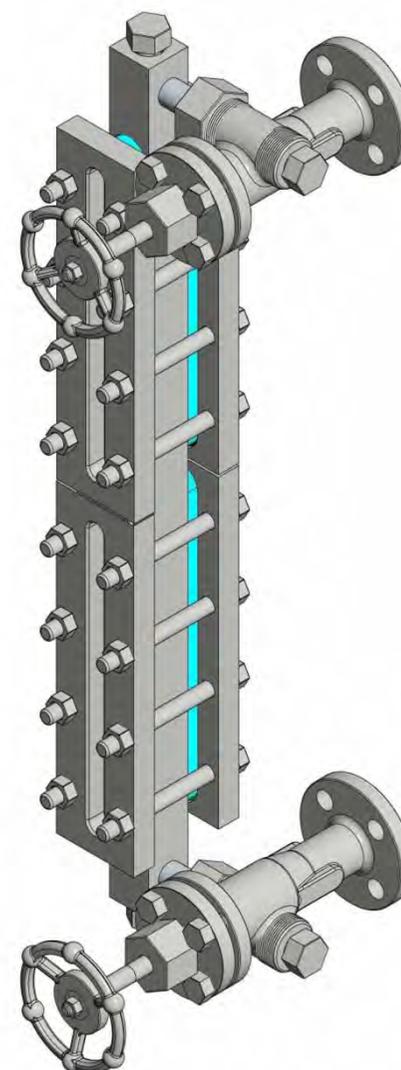
With special execution



SIDE -SIDE



RAV 947

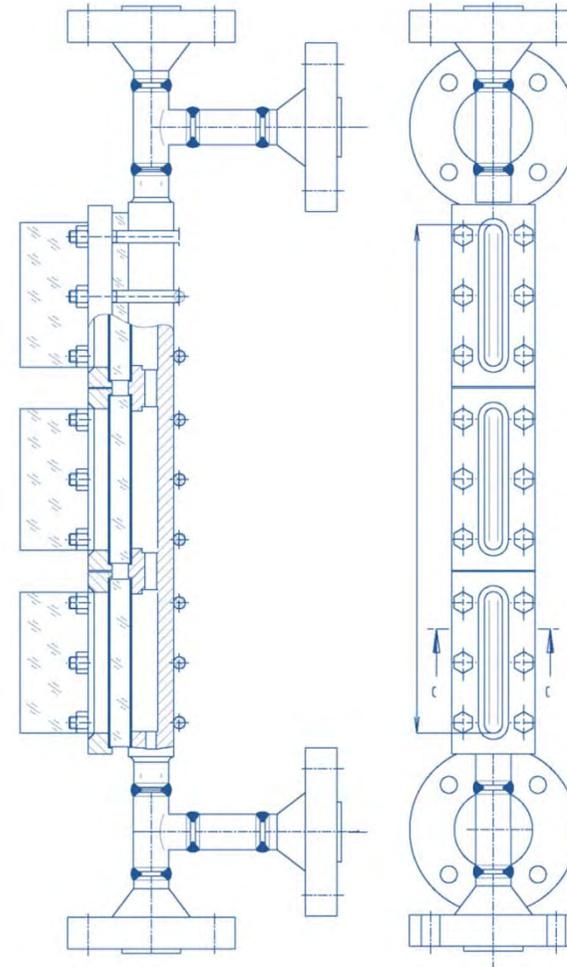
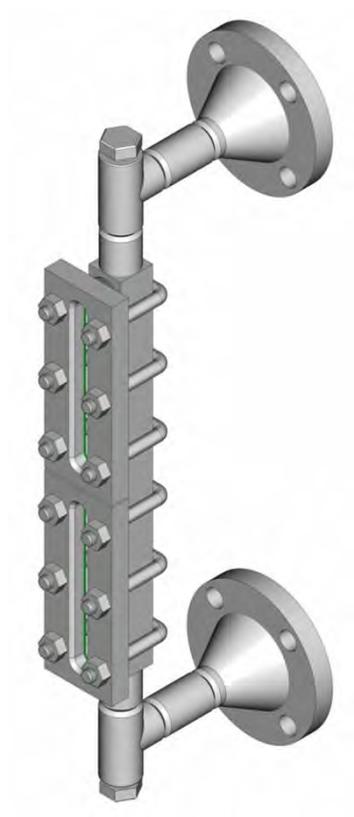


SPECIAL GAUGES

With special execution



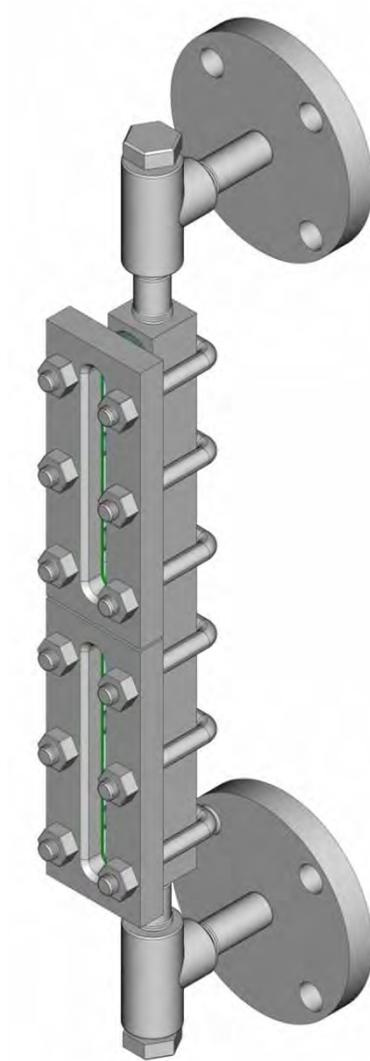
TEE DESIGN COMPLETELY BW (SHELL DESIGN)



SPECIAL GAUGES

With special execution

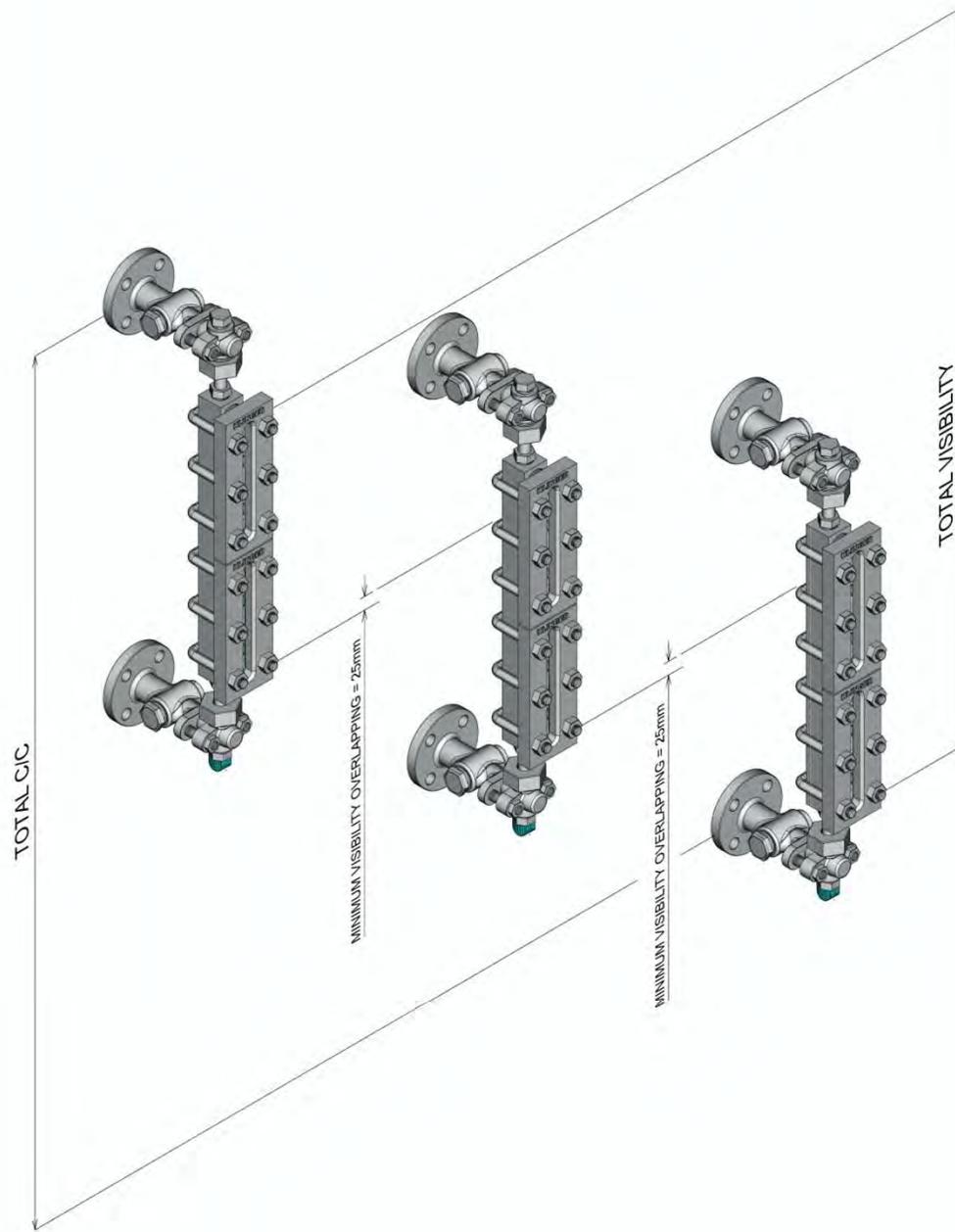
**TEE DESIGN
THREADED AND WELDED**



SPECIAL GAUGES

With special execution

OVERLAPPING

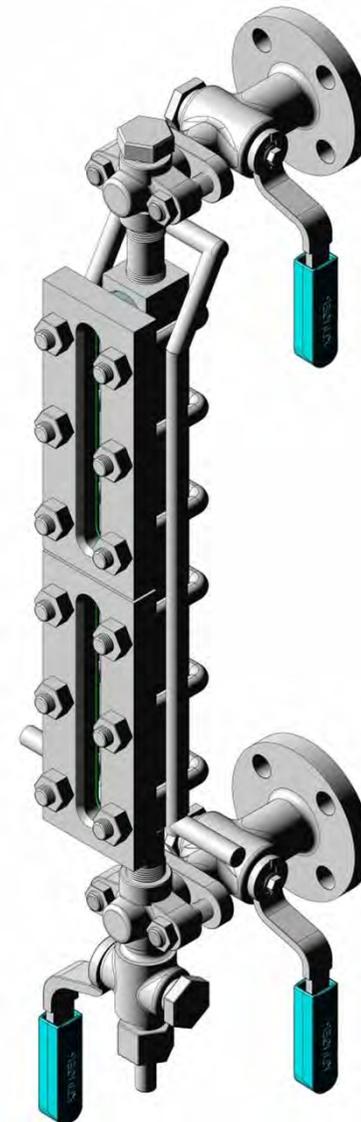
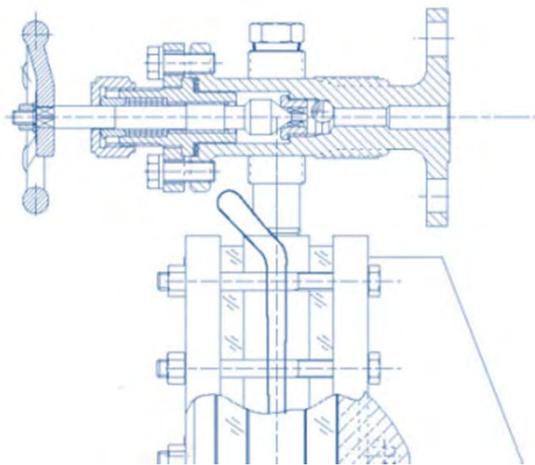


SPECIAL GAUGES

With special execution



EXTERNAL PIPE HEATING

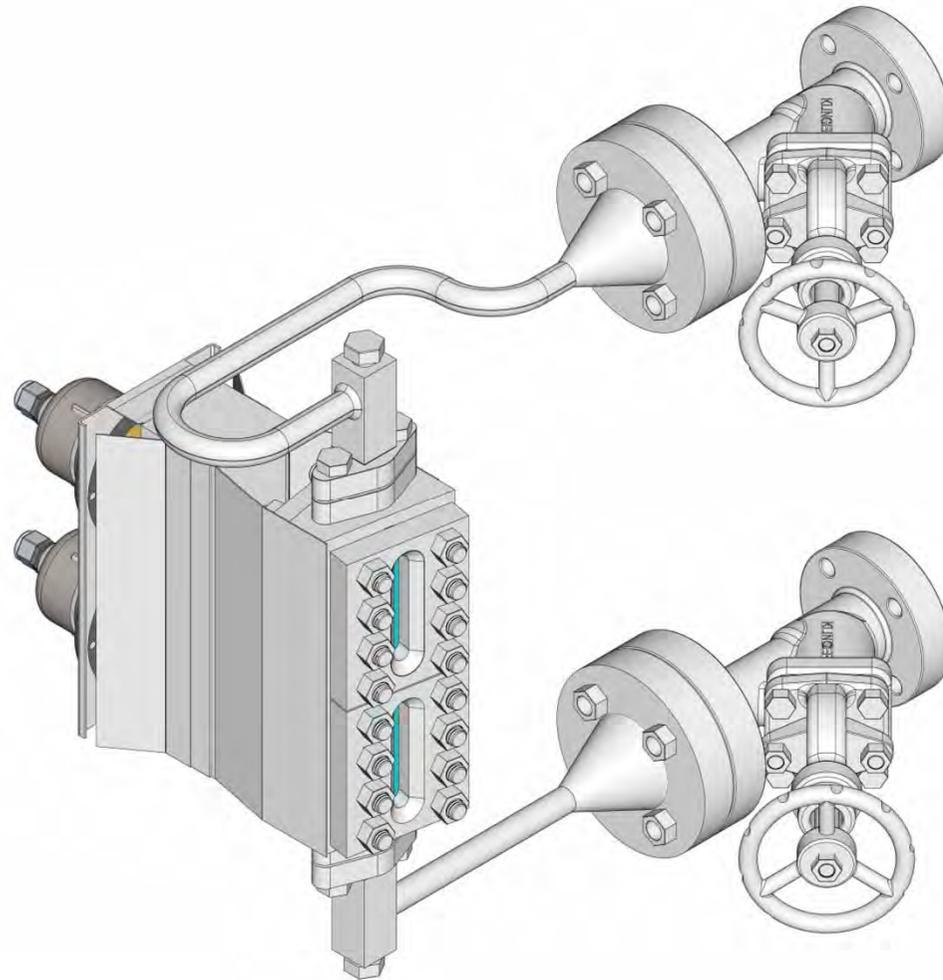


SPECIAL GAUGES

With special execution



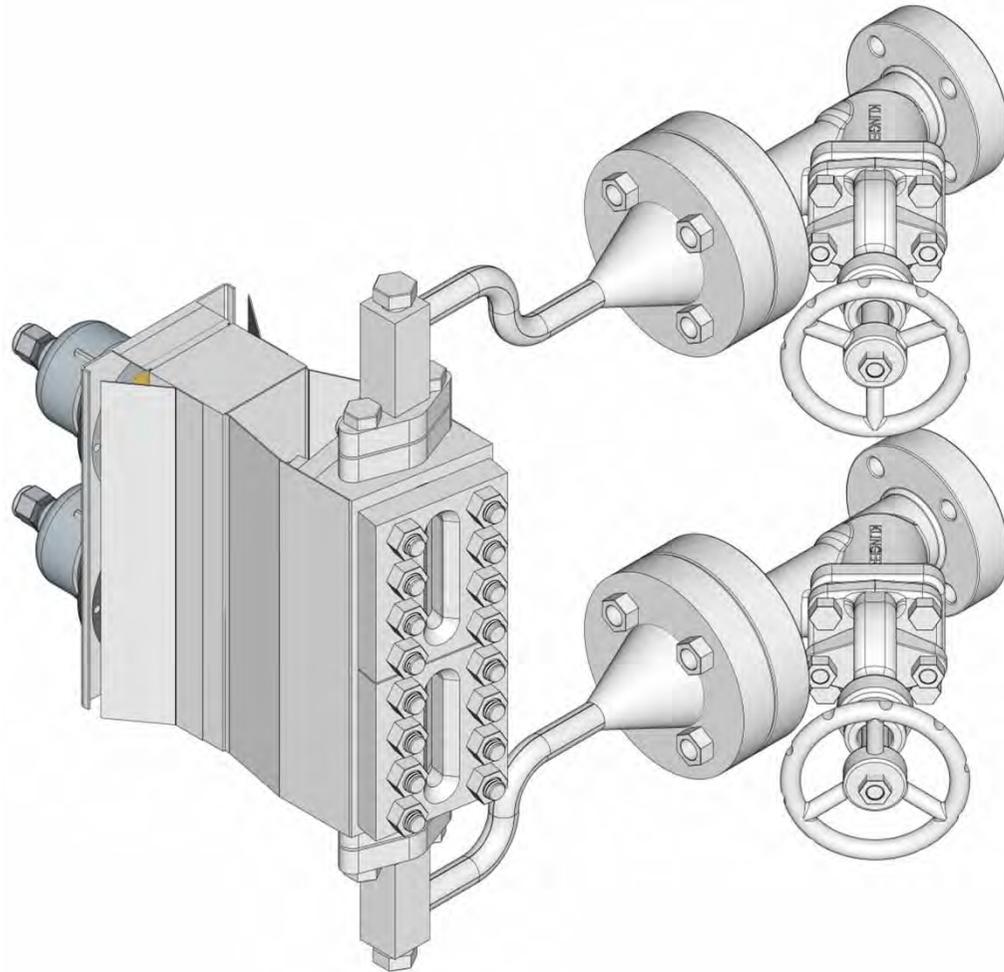
**LOOP DESIGN
FOR THERMAL
DILATATIONS**



SPECIAL GAUGES

With special execution

**LOOP DESIGN
FOR SHORT C/C**

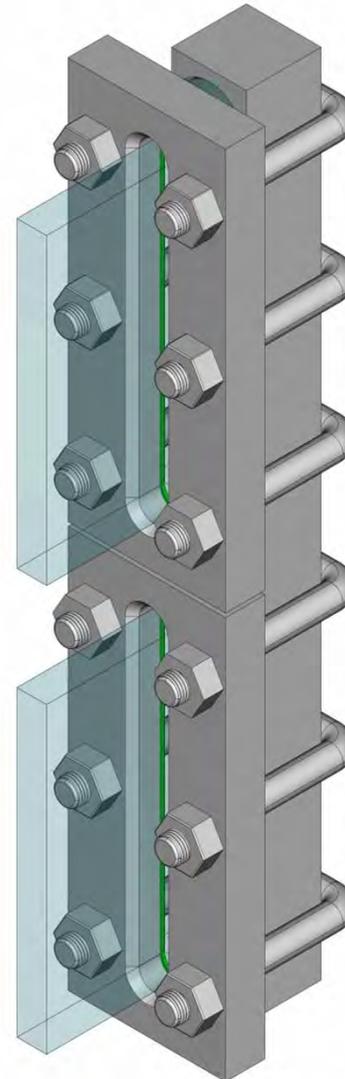
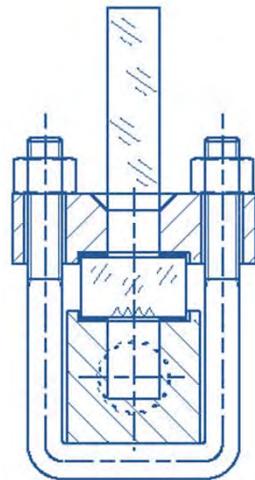


SPECIAL GAUGES

With special execution



NO FROST BLOCK

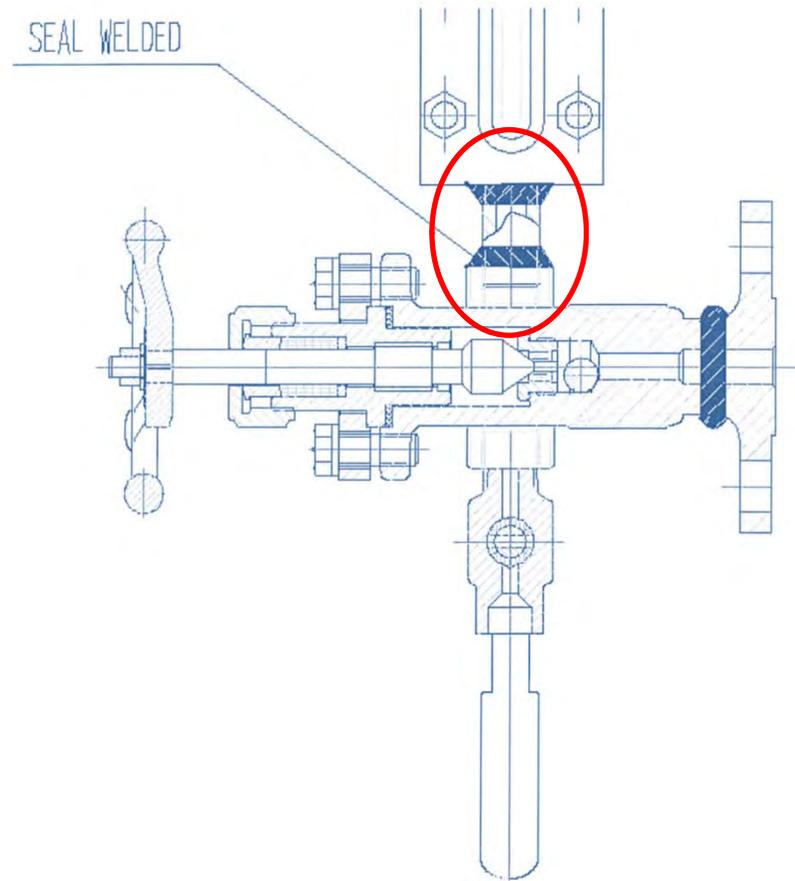


SPECIAL GAUGES

With special execution



SPECIAL VALVES SEAL WELDED



ILLUMINATOR

for transparent and bicolour level gauges

- Protection Degree: IP66
- Electrical Construction/Group: EEx d IIC
- Temperature Class: T5=60W
(on request T6=15W Low Consumption)
- Standard Input: 220/240V (max 380V) - 50/60Hz
- Illuminating armor: EVA 50 model
- Electrical connection: 3/4" NPT/F
(Option M20x1,5 or 1/2")
- Glass or Plexiglass diffusers
- Special Led lamps for EVA illuminator available
- Temperature Class: T6 = 5W – LED (Option)

CERTIFICATE on request:

- ATEX
- GOST



LED Illuminator Level Gauge



LED ILLUMINATOR

New more compact design brighter
lighter weight
lower dimensions
longer shelf life
better light emission

CHARACTERISTICS

Protection IP 66
resistance to moisture
temperatures up to 46°

Material :AISI 316

Gland: M20x1,5

PAINTING CYCLES

- 1- PAINTING SYS 006 350 HT SUITABLE UP TO 350 °C
- 2- PAINTING SYS 006 HT SUITABLE UP TO 600 °C
- 3- PAINTING SYS 002 (EPOXY) SUITABLE UP TO 120 °C

OTHER SPECIAL COATINGS ON REQUEST



THANK YOU
FOR YOUR ATTENTION