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6200 SERIE
LIQUID LEVEL GAUGES

INSTALLATION MANUAL

READ COMPLETELY BEFORE ATTEMPTING INSTALLATION

*Consumers are not qualified to perform installation described below.
For any question, please contact Rochester Gauges or authorized distributor for
assistance.*

WARNING: *Improper installation or use of this product may cause serious injury
or property damage.*

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1. PRODUCT DESCRIPTION:

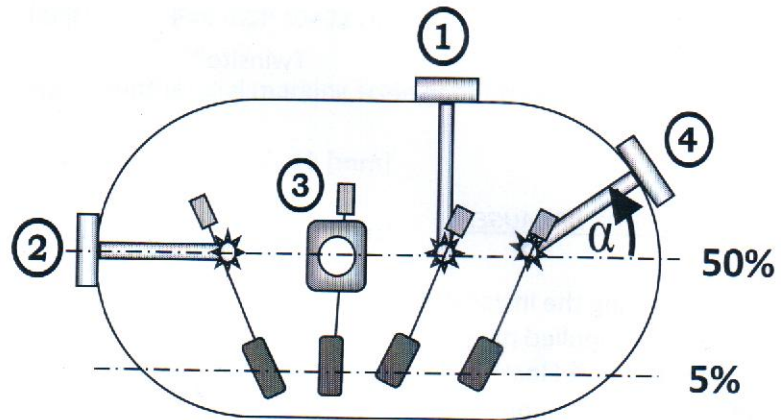
6200 gauges serie are mechanical float arm type, magnetically coupled to dial to be installed on storage tanks with diameter up to 2000mm. These are currently used to gauge products such as LPG, Ammonia, Refrigerants, DME, Hydraulic oils, Fuel Oil, etc...

The gauge operates by means of a float actuating a powerful magnet inside the flange (head) which in turn provides an invisible magnetic coupling (through the leak-tight flange) together with the magnet of the dial pointer. The dial may be removed and replaced quickly at any time without loss of liquid, pressure, vacuum or costly downtime.

These gauges are designed for pressure up to 30 bars and temperature of -40°C to +70°C if adequate construction materials are used.

2. MOUNTING POSITION:

- ① TOP
- ② END
- ③ SIDE
- ④ ANGLE *



(*) angle to be specified from horizontal pane (positive above horizontal, negative below)

3. MODEL IDENTIFICATION:

JUNIOR : Ø40mm dial Ø51.6mm bolt circle
 SENIOR : Ø50/100mm dial Ø63.5mm bolt circle

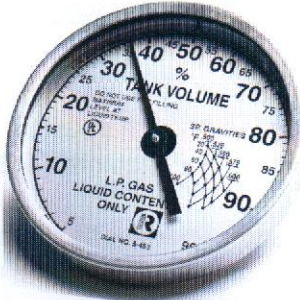
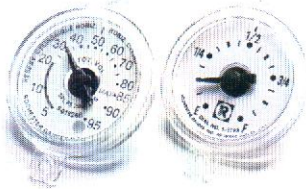
MODEL N°	FLANGE SIZE	DIAL	MOUNTING
6241	JUNIOR	TWINISTE™ (ELECTRICAL OUTPUT DIAL)	TOP
6244			END / SIDE / ANGLE
6240	SENIOR		TOP
6243	SENIOR		END / SIDE / ANGLE
6260		SIDE READING	TOP
6281	JUNIOR	DIRECT READING Ø40MM	TOP
6284			END / SIDE / ANGLE
6280	SENIOR	DIRECT READING Ø50MM	TOP
6283			END / SIDE / ANGLE
6290		DIRECT READING Ø100MM	TOP
6293			END / SIDE / ANGLE

- OPTIONS:
- Brass head (B suffix)
 - Aluminium float bulb
 - Stainless Steel float bulb (A suffix)
 - Metal cover (hinged) with window

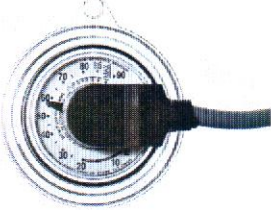
Senior 4" (Ø100mm) dial

Junior (Ø40mm) dial

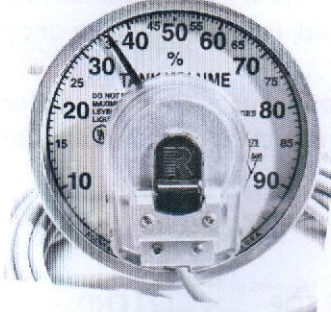
Senior (Ø50mm) dial



Twinsite™



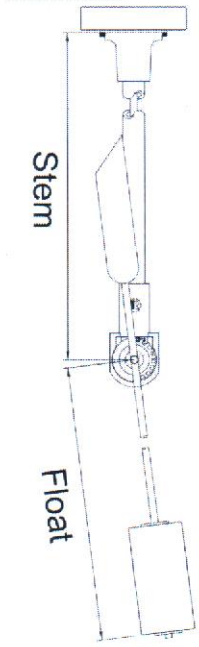
Twinsite™



Twinsite™

4. INSPECTION OF GAUGE:

Before attempting the installation of the gauge, check if the gauge is adequate for your application: the gauges are supplied packed in a cardboard box with a sticker indicating model number, main dimensions (Stem & Float), mounting position, tank dimensions for which the gauge has been manufactured and the product to be gauged.



PART NUMBER _____					
CUSTOMER _____					
PO N° _____			QUANTITY _____		
BATCH N° _____			TYPE _____		
SCREW	YES	NO	GASKET	YES	NO
GAUGE INTENDED FOR _____					
TANK OUTSIDE DIAMETER _____					
TANK INSIDE DIAMETER _____					
RISER _____					
MOUNTING POSITION _____					
STEM _____					
FLOAT _____					

Stem length:

The pivot point (gears) of the float gauge should be on the mid height/diameter of the tank (50% content), hence the Stem length [S] should be:

- TOP / ANGLE mounting: $S=0.5*OD+H$ [mm]
- END / SIDE mounting: $S=0.3*OD+H$ [mm]

Where "OD" is the tank outside diameter and "H" the riser length.

Float length:

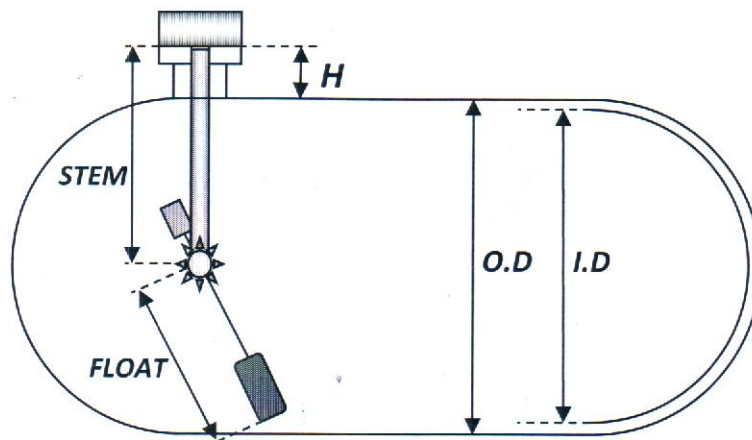
The float arm is sized according to the dial indication (being 5-95% in most cases), the tank inside diameter (ID) and the float bulb length (to be half immersed for optimal accuracy):

- Nitrile float (63mm long): $F=0.428*ID+31.5$ [mm]
- Aluminium float bulb (89mm long): $F=0.428*ID+44.5$ [mm]
- Stainless Steel float (64mm long): $F=0.428*ID+32$ [mm]

Some particular applications may require another dial marking scale or another float bulb length, for which different formulas apply.

In any case the float arm may not be longer than $0.5*ID-10$ [mm]

**unless specified general manufacturing tolerances are +/- 3 [mm]*



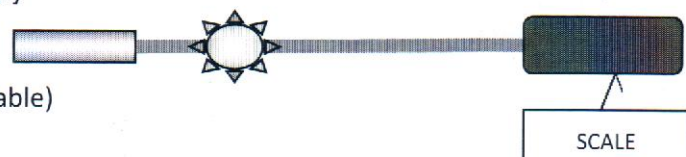
Mounting position:

To check mounting position for which the gauge has been manufactured, hold the stem in the mounting position (vertical, horizontal or angle), move the float arm to the horizontal plane and check the needle on the dial indicates 50% +/-5%.

Counterweight – Float buoyancy:

Depending on liquid density, for low specific gravity the float arm is equipped with a counterweight to ensure float buoyancy (50% immersed into liquid). To check if the float arm has been counterbalanced to the product you intend to gauge, set the float bulb on a scale and maintain the float arm horizontally, the weight [W] should be:

$W=\delta*V/2$ [gr] with a tolerance of +/- 2[gr]



Where "V" is the float bulb volume (see table)

Float p/n	Material	Volume	Length	Weight for LPG ($\delta=0.55$)
0006-00620	Nitrile (standard)	36 [cm ³]	63 [mm]	10 [gr]
0006-00406	Aluminium	46 [cm ³]	89 [mm]	13 [gr]
0006-00407	Aluminium (short)	31 [cm ³]	64 [mm]	9 [gr]
6045S00000	Stainless Steel	42 [cm ³]	64 [mm]	12 [gr]
6085S00000	Stainless Steel (long)	62 [cm ³]	89 [mm]	17 [gr]

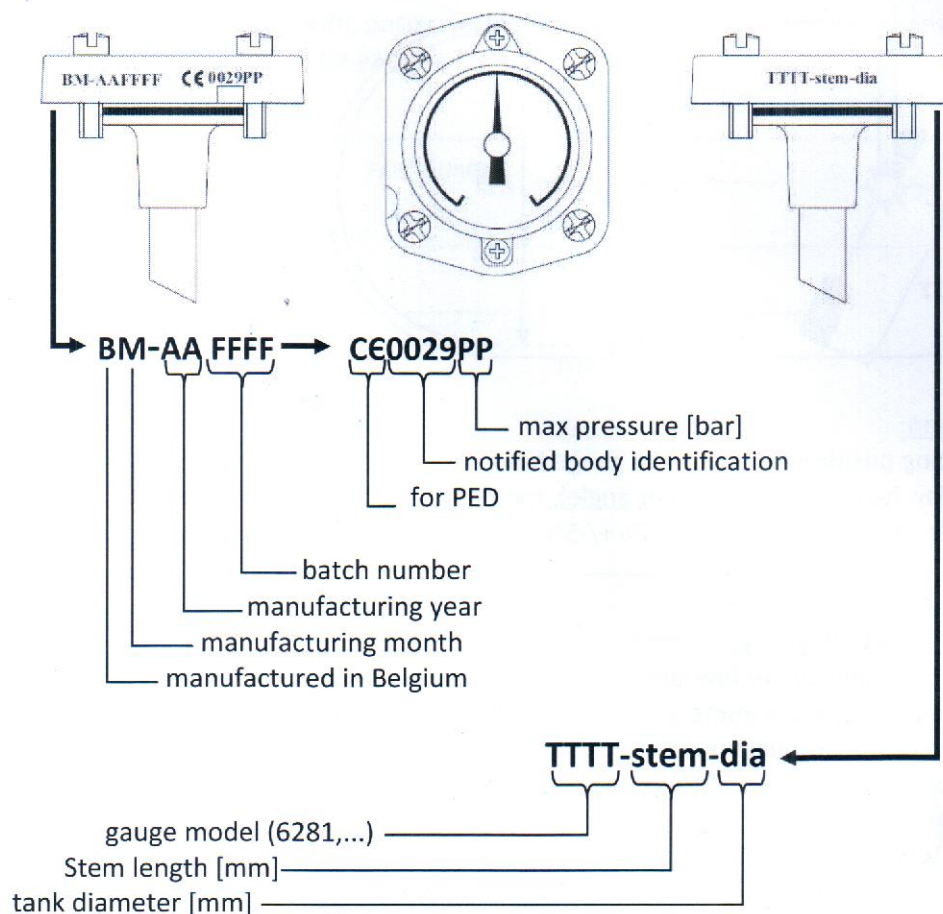
Operation – Float movement:

Although the gauges are 100% checked before packing, it is necessary to verify that the gauge has not been damaged in transit. In order to check this, hold the gauge in its intended mounting position and move the float arm slowly upwards and downwards: the movement should be smooth without any heavy point allowing the dial needle to follow the float travel accordingly with the same smooth needle travel.

5. MARKING:

The lateral sides of the head are marked with the necessary datas requested to identify the gauge, such as batch number, ce or R67 marking, tank data (if known) and model number.

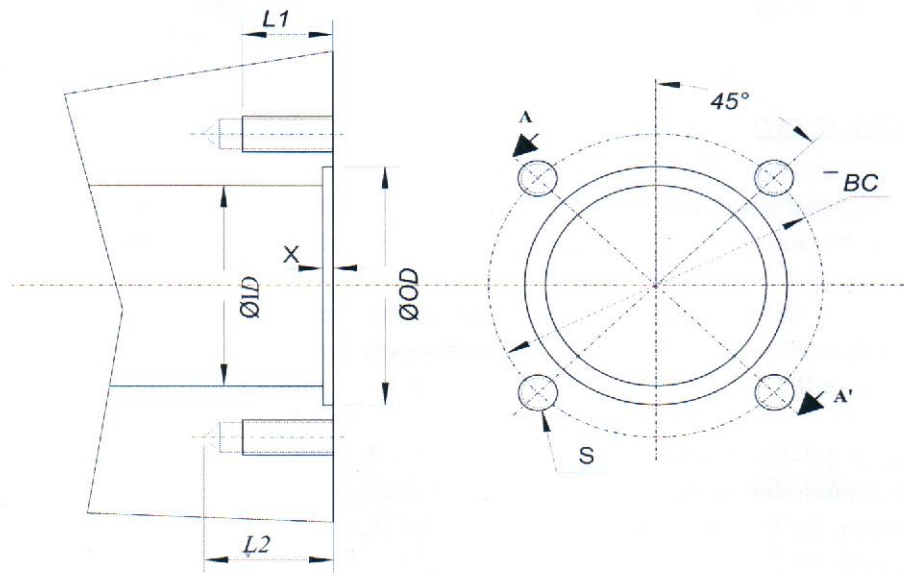
The presence of “B” letter prefix for batch number indicates the gauge has been manufactured by Rochester Gauges International S.A. Belgium.



6. ADAPTER - FLANGE:

Typically an adapter (flange) is welded on the tank, check if the adapter is appropriate for gauge + gasket + mounting bolts:

	FLANGE					GASKET				
	BC	OD	ID	L1	L2	TYPE	OD	ID	TH	X
JUNIOR	51.6	40.5	34.1	14	20	FLAT	39.3	32.9	2.4	1.6
		40.0	34.0	14	20	O-RING	38.4	31.34	3.5	3.8
SENIOR	63.5	53.2	42.0	14	20	FLAT	52	40.5	2.4	1.6
		52.5	42.0	15	20	O-RING	47.9	40.87	3.5	4



	Screw size	Dry torque	Gasket
Junior	M6x25 or 1/4"x7/8"-28UNF	2.3 to 5.6 [Nm]	Buna-N
Senior	M8x25 or 5/16"x7/8"-24UNF	3.4 to 6.8 [Nm]	Buna-N

CAUTION: do not over-torque. Do not re-torque later unless leaking. Over-tightening may cause damage to head and gasket with a consequence of potential leaking path.

7. INSTALLATION:

Fit the gasket onto gauge's gasket seat.

Carefully insert float arm into adapter or coupling then gear housing and stem through the adapter being careful not to bend or damage them (counterweight should not be permanently bended).

Verify that gasket is properly seated in the adapter gasket recess.

Align head for proper/adequate orientation of float arm inside the tank: make sure there are no potential interferences of float arm nor counterweigh with any inside pipe or baffle.

Torque the (4) screws evenly in several steps to the recommended torque value (see below), using a crossing torque pattern.

Model	Screw size	Dry torque	Gasket
Junior	M6x25 or 1/4"-28UNF	2.3 to 5.6 [Nm]	Buna-N
Senior	M8x25 or 5/16"-24UNF	3.4 to 6.8 [Nm]	Buna-N

CAUTION: do not over-torque. Do not re-torque later unless leaking. Over-tightening may cause damage to head and gasket with a consequence of potential leaking path.

8. DIAL REPLACEMENT:

Determine and install the appropriate dial based on gauge and system requirements. The dial type supplied may not be suitable for all applications and for those applications other dials are available.

WARNING: Do not remove gauge mounting screws or bolts; tank contains high pressure flammable gas. A hazard of fire or explosion may exist if gauge mounting screws, bolts or gauge's head are loosened or removed!

Record reading on old dial, disconnect connection to Twiniste™ (if in place).

Using a Philips screwdriver, remove the (2) screws retaining the old dial chamber and remove it. Install replacement dial (or Twiniste™) assuring that dial chamber fits gauge head and torque dial mounting screws at 0.4 [Nm].

Compare new dial reading to recorded reading or estimated tank content.

If the new dial reading is not correct, remove dial and use a magnet near the back of the dial, rotate the pointer to approximate the expected dial reading and re-install dial.

If reading still seems incorrect, the dial may be a wrong type.

CAUTION: improper selection or application may result in inaccurate gauge readings. Release of tank content as well as damage to equipment and safety hazard may result if tank is overfilled. Combustible exhaustion may occur if tank content is more than indicated.

9. REFRIGERANTS WARNING:

Specially designed gauges can be used with refrigerant gases except R12B1, R21, R22, R40, R40B1, R114B2.

These gauges are rated for 30 bars pressure and temperature of -40° to +70°C.

The gasket has to be selected according to the refrigerant (with consultation of Rochester Gauges).

10. TROUBLE SHOOTING:

Even after having followed all above mentioned instructions some field problem may occur due to external sources, mishandling or environment effects.

Typically encountered problems being listed below, please contact Rochester Gauges for any further assistance required.

SYMPTOM	LOOK FOR:
<i>Gauge not reading at low extreme when installed in empty tank</i>	<ul style="list-style-type: none">-Float striking obstructions such as dip pipes or baffles.-Float or counterbalance striking tank wall -> incorrect gauge.-Float not dropping under its own weight -> defective gauge.-Float arm too short for counterbalance.-Broken dial.
<i>Gauge continues reading at low extreme when tank is full</i>	<ul style="list-style-type: none">-Obstruction inside the tank bottom.-Float improperly counterbalanced for liquid being gauged.-Float leaks and is filled with liquid.-Misalignment of counterweight (bended).-Broken dial.-Gears – Pinion drag.
<i>Gauge reading at some midpoint regardless of liquid level</i>	<ul style="list-style-type: none">-Float or counterweight striking internal obstructions.-Float partially sunk due to leakage or improper counterbalancing.-Float hung/loose.-Dial pointer stuck due to damage or corrosion.-Incorrect or modified float arm installed on gauge.-Gears – Pinion drag.
<i>Gauge indicating liquid level inaccurately</i>	<ul style="list-style-type: none">-Gauge not fitting the tank -> incorrect gauge.-Mounting coupling/flange not aligned with tank axis.-Tank is not level.-Liquid – Temperature volume changes not accounted for.-Gears – Pinion drag.

11. WARRANTY:

From date of invoice, Rochester Gauges International S.A. guarantees its products for a period of 12 months. This warranty is limited to the product supplied and consists of repair or replacement of the defective part, after inspection in our factory. Incriminated product should be shipped back (at customer's expenses) according to RMA procedure, unless agreed otherwise by the parties (contact customer service info@rochester-gauges.be).

No claim for misapplication, labour, direct or consequential damage will be allowed.

12. RETURN OF MATERIAL AUTHORISATION:

Should you face a claim or have defective part you need to return for inspection, analysis or repair; please proceed as follows:

-send e-mail at info@rochester-gauges.be containing all information's about incriminated part, including batch number.

-wait for Rochester e-mail answer, providing you with a RMA form and N° if necessary, or technical assistance on the subject.

-if required/agreed, ship the part back to:

*Rochester Gauges International
6 Avenue Lavoisier
B1300 Wavre Belgium*

with RMA N° printed/written on the box and a copy of "RMA.doc"

As per Rochester's terms & conditions, incriminated part returned to us should be at customer's expenses and depending on the defect causes and warranty period, return of material after inspection will be at customer's or Rochester's costs. Any specific circumstances to be discussed and agreed before shipment.