



**Masoneilan**

Putting You In Control

Specification Data

CU 12400

01/10



# 12400 Series Digital Level Transmitter / Controller

Digital Instrument  
for Liquid Level  
and Interface Measurement



## Overview

Building on the success of the 12300 Series, the Dresser Masoneilan 12400 Series Digital Level Transmitter/Controller marks a significant evolution in process control. The SIL2 compliant\* 12400 Series' advanced design and technology reduces complexity, saves time and money, and delivers precise performance previously unavailable in the market.

With a combination of features such as smart filtering, HART® communication protocol compatibility and an optional 4-20mA analogue output signal among many others, the 12400 Series offers exceptional process control for a wide range of applications, including severe service. It is the first level instrument that integrates level transmitter, controller and switch functions in a single device. Plus, it is easy to install and operate. It is also engineered for optimum efficiency, upgradeability and reliability making it a cost-effective investment for the long term.

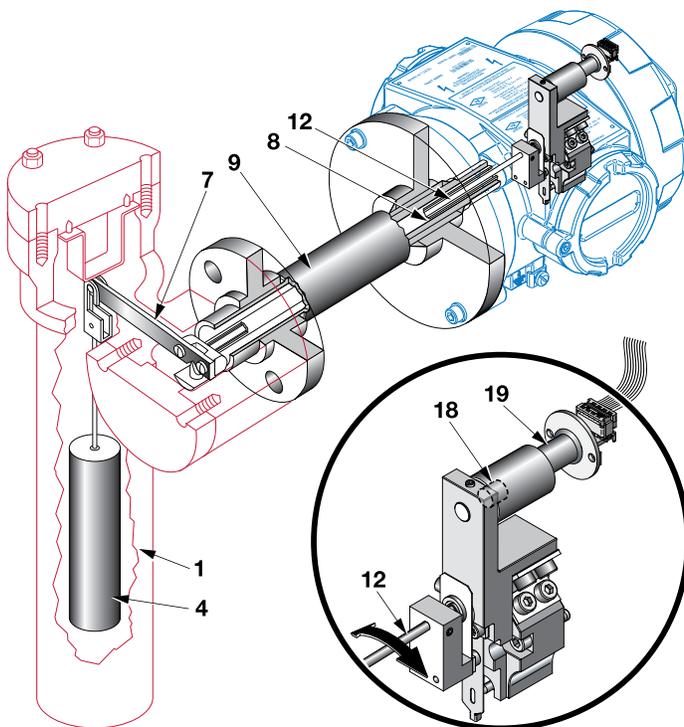
## Principle of Operation

The Dresser Masoneilan 12400 series instrument is a 2 wire, loop-powered Level Transmitter or Controller with HART Communication, that operates according to the fully proven buoyancy and torque tube principles. A change in liquid level varies the net weight of the displacer (4), increasing or decreasing the load on the torque tube (8) by an amount directly proportional to the change in liquid level. The resultant rotation of the torque rod (12) and attached magnets (18) modifies the magnetic field surrounding

a non-contact sensor (19), producing an analog signal proportional to the level in the vessel. This analog signal is converted into an error-free digital signal that is processed by the on-board micro-controller. After processing, the digital result is converted to a 4-20 mA analog output signal.

This sensing method is non-contacting, frictionless and provides total isolation between the sensed motion and sensor output.

## Descriptive Sketch



Sketch showing the arrangement of the different parts. In black: torque tube, arm and displacer.

In red: mechanism and displacer chambers.

In blue: instrument head.

- 1 - Displacer chamber
- 4 - Displacer
- 7 - Torque arm
- 8 - Torque tube
- 9 - Torque tube housing
- 12 - Torque rod
- 18 - Magnets
- 19 - Non-contact sensor

Trade names noted throughout are for reference only. Dresser Masoneilan reserves the right to supply trade named material or its equivalent.

\*Approval pending

## Key Benefits

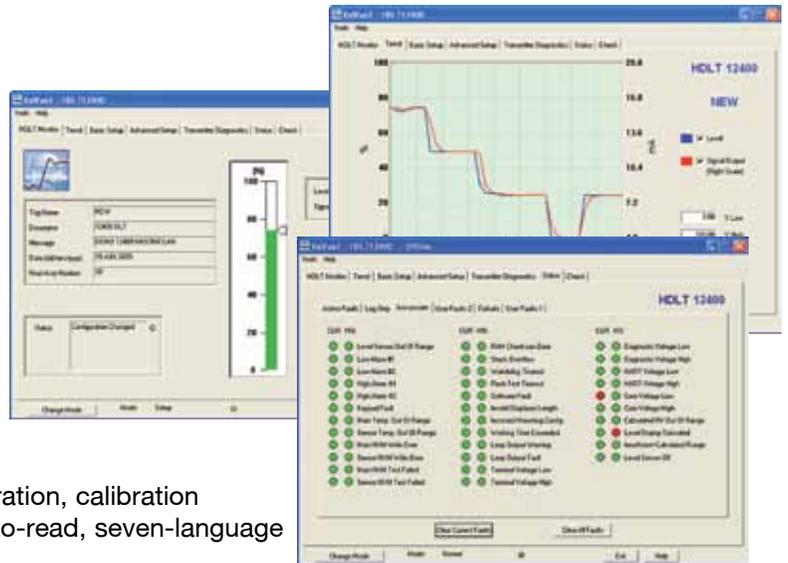
### Reduced Complexity

While the 12400 Series offers powerful control functionality, it delivers efficiency for simplified ownership and operations.

**Easy Installation** - Local and remote installation via three explosion-proof push-buttons and the HART® communication protocol, and it can be calibrated with or without fluid, including fluid with an unknown specific gravity.

**Simple Operation** - Automated configuration, calibration and diagnostics functions as well as an easy-to-read, seven-language LCD display.

**Interoperability** - Seamless field data integration across multiple communication platforms: Dresser Masoneilan ValVue® software, Device Description (DD) and Device Type Manager (DTM), any HART®-compatible handheld and ValVue® software plug-in and snap-on.



User Friendly Instrument Health Summary

### Cost-Effective

The 12400 Series saves money, time and other valuable resources through its advanced functionality, reliability and scalability.

**Streamlined Functionality** - The first level instrument to offer integrated level transmitter, controller and switch functions in a single device so there is no need for additional controllers and switches.

**Durability for Long Term Service** - Accurate, non-contacting sensor for reduced wear and reliable performance and **rugged construction** for protection from weather and harsh elements.

**Cost-Saving Upgradeability** - Flash ROM firmware for future-proof scalability.

### Advanced Process Control Performance

With a range of outstanding features in a durable, flexible package, the 12400 Series meets some of the industry's most demanding application requirements.

**Compliance** - SIL2 compliant\* and holds full hazardous areas certifications including ATEX, IECEx, FM and FMc (Factory Mutual Canada).

**Severe Service Capable** - Withstands high temperature, high pressure and demanding NACE applications.

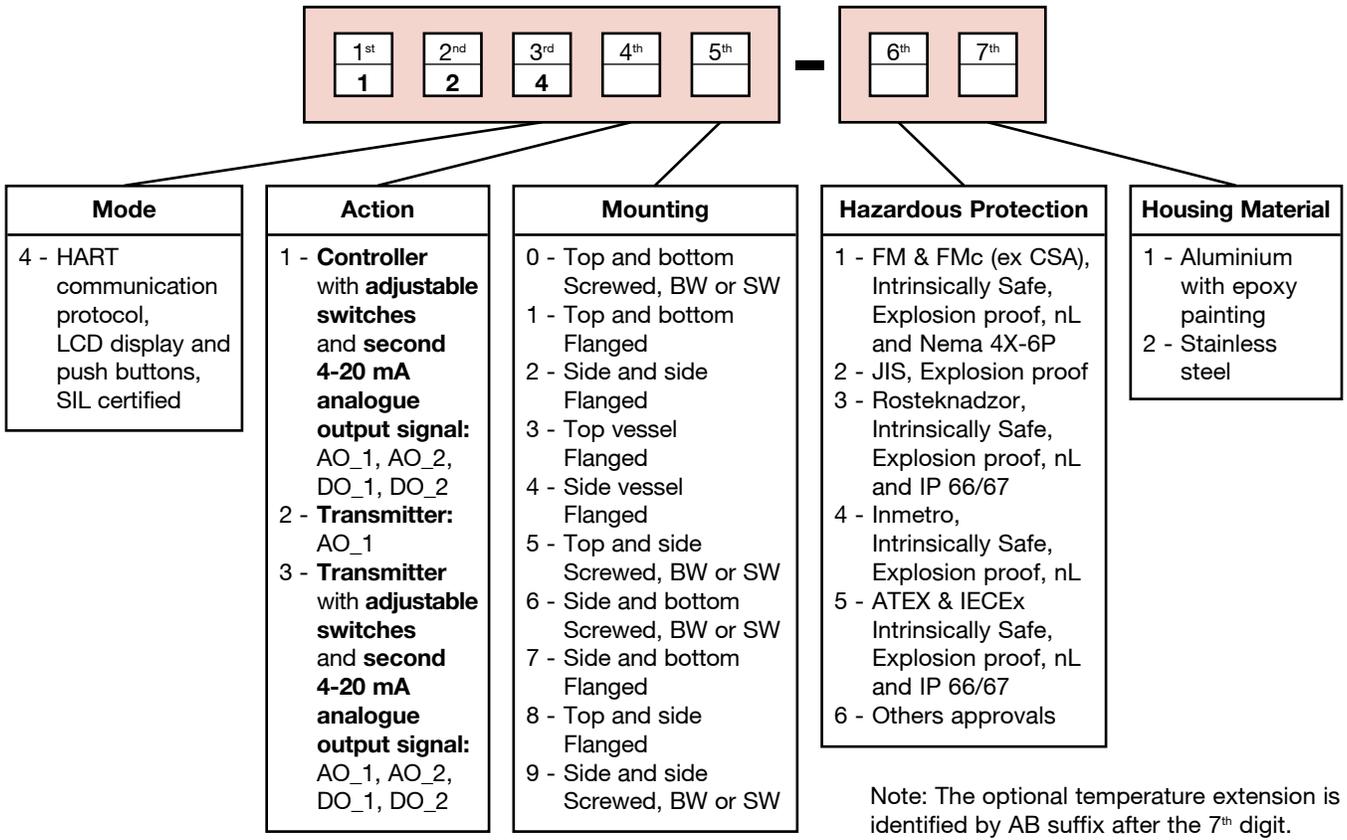
**Flexibility** - Meets most installation requirements and accommodates most process structures through top, side or bottom connections and full horizontal plane rotation.

**Accuracy** - Smart filtering reduces unwanted oscillations without changing response speeds, and the frictionless sensor offers 0.1 percent measurement resolution.

**Stability** - Inside a chamber, surface turbulence and foam do not impede the displacer, and process fluid agitation does not affect measurement.

**Reliable Data** - Continuous recording and recent data is stored in non-volatile memory for dependable access in the event of power failure.

# Numbering System



## Pressure Envelope Characteristics

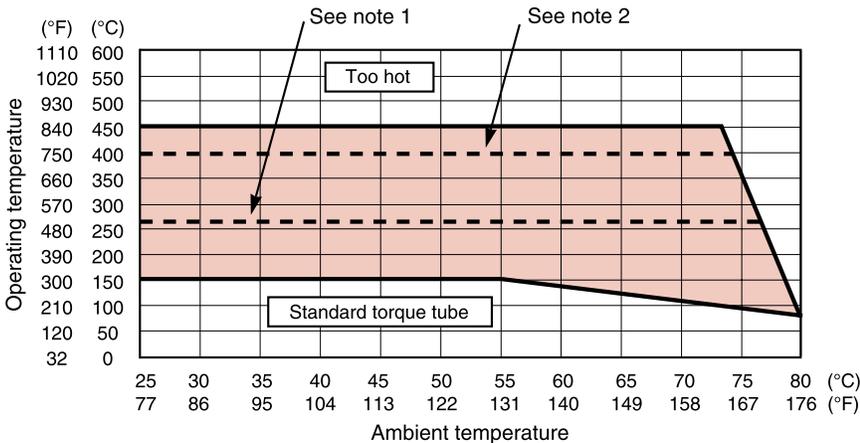
### Rating

ANSI class 150 to 2500  
PN 10 to PN 420

### Ranges

356, 610, 813, 1219, 1524, 1829, 2134, 2438, 3048 mm  
(14", 24", 32", 48", 60", 72", 84", 96", 120")  
Other ranges on request

## Temperature Limits

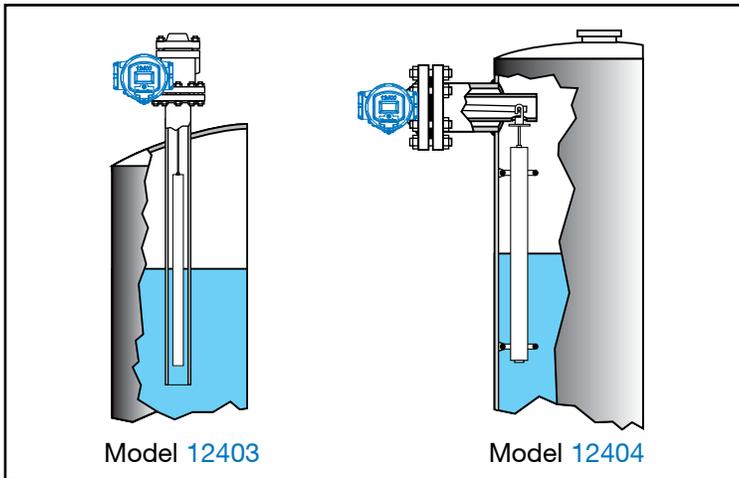


Use an extension between case and torque tube for temperatures included in colored area

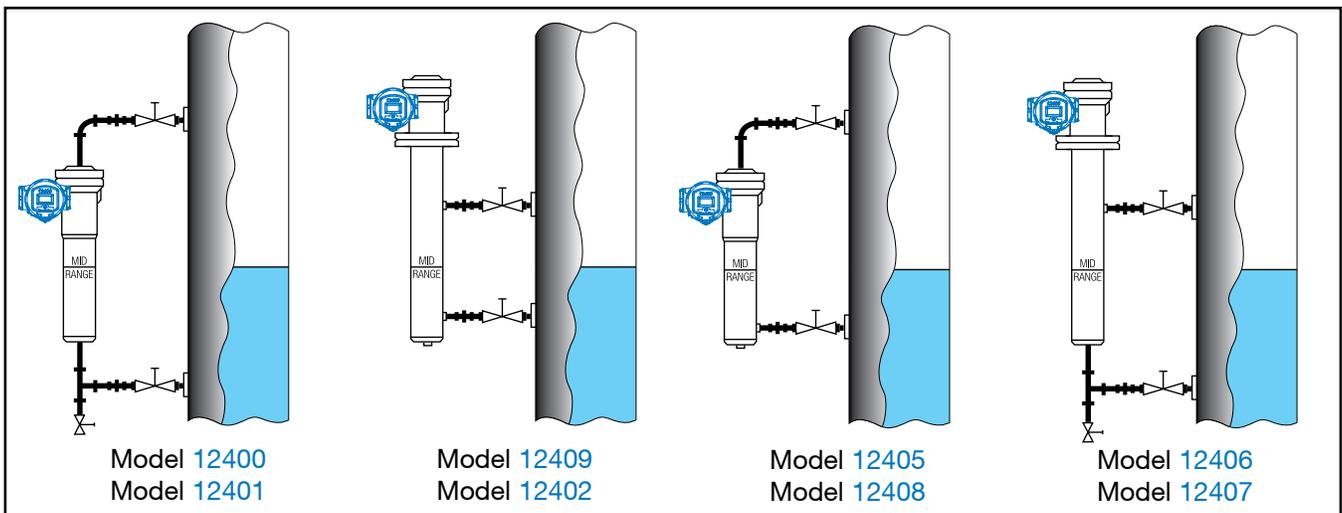
#### Notes:

- 1 - Above 260°C (500°F), torque tube must be in Inconel.
- 2 - 12402, 12406, 12407 and 12409 models only, for stainless steel version, can be used between +400°C (+750°F) and +450°C (+850°F).
- 3 - For devices installed in hazardous location, temperature limits depend on the marking. See page 8 for complete information.

# Mounting



In case of internal mounting, the instrument has no displacer chamber; the mechanism chamber flange is bolted directly on the vessel flange.  
In case of liquid turbulence, it is recommended that the displacer is isolated with a damping chamber to prevent oscillations.



In case of external mounting, the instrument is connected to the vessel either with flanges or with screwed or welded connections. The instrument is constructed so that the mid range level reference on the displacer chamber coincides with the normal level in the vessel.

It is recommended that shut-off valves are inserted between the level connections and the vessel, with a drain valve on the lower part of the level.

Model	Connections
12400	BW, SW or Screwed NPT - 1 1/2" and 2" - DN 40 and DN 50
12401	Flanged - 1 1/2" and 2" - DN 40 and DN 50
12409	BW, SW or Screwed NPT - 1 1/2" and 2" - DN 40 and DN 50
12402	Flanged - 1 1/2" and 2" - DN 40 and DN 50
12405	BW, SW or Screwed NPT - 1 1/2" and 2" - DN 40 and DN 50
12408	Flanged - 1 1/2" and 2" - DN 40 and DN 50
12406	BW, SW or Screwed NPT - 1 1/2" and 2" - DN 40 and DN 50
12407	Flanged - 1 1/2" and 2" - DN 40 and DN 50
12403	Flanged - 3" and 4" - DN 80 and DN 10
12404	Flanged - 4" - DN 100

### Flanges:

- Class flanges according to EN 1759-1 and ASME B16-34 standards,
- PN flanges according to EN 1092-1 or DIN standards,
- Others standards and dimensions, please consult Dresser Masoneilan.

# General Data

## Instrument

### User Interface:

- . Handheld Communicator
- . Push-buttons operation with digital display
- . ValVue software
- . ValVue AMS® snap-on
- . ValVue PRM® plug-in
- . DTM though any FDT/DTM compatible host



### Level Transmitter:

- . Level or interface level measurement
- . Specific gravity measurement and display (only with the displacer fully immersed)
- . Zero and span digital calibration:
  - independent zero and span adjustment
  - current loop range independent from zero/span calibration (can be changed at any time without zero/span re-calibration)
  - manual or automatic calculation for reduced span and zero shift for interface service
- . Selftuning for smart filtering
- . Selectable low and high level alarms
- . Adjustable failsafe output signal immediately activated in case of a failure detection
- . Continuous self-diagnostic with bargraph
- . Continuous data record: number of filling up, low level time, high level time, working time
- . Configuration check: analysis of 12400 data base to avoid bad mounting, out of range use
- . Storage and display of alarms that have appeared
- . Output current generator for loop check

### Level Controller:

- . With P, I, D,.. parameters
- . Low and high level alarms
- . Other functionalities including same as transmitter, where applicable

### Level Switches

- . Two built-in solid state switches: 1A – 30 Vdc
- . Configurable: low and high level alarms, fault or reset occurred, instrument in failsafe...

### Second 4-20 mA Analog Output

- . Second level variable measurement
- . Useful to connect a local level indicator
- . Useful when instrument is a level controller as main 4-20 mA output is the controller output

**Action:** Direct or reverse by software

### Output Signal Filtering:

- . First order filtering of output signal with adjustable time constant
- . Smart filtering of contactless sensor output signal, to eliminate noise before digital signal processing

### Software and Hardware Locks:

- . Software lock for push-buttons
- . Hardware jumper lock for full protection against parameter change

# General Data

## Operating Limits

### **Ambient Temperature Limits:**

- . Operating: -50°C to +80°C (-58°F to +176°F)  
For devices installed in hazardous area, temperature limits depend on the marking.
- . Storage and transportation: -45°C to +93°C (-50°F to +200°F)

### **Process Temperature Limits:**

- . -210°C to +450°C (-350°F to +850°F)  
For temperature higher than +150°C (+302°F) or lower than -100°C (-150°F), an extension is required between the case and the torque tube. Note: See diagram page 4.

### **Specific Gravity Range:**

- . 0.15 to 1.4 with a standard displacer
- . Lower and higher specific gravities with special displacers

### **Electric Characteristics (transmitter/controller)**

#### **Following NAMUR NE 43:**

- . Normal output signal: 3.8 to 20.5 mA
- . Low failsafe output signal ( $\leq 3.6$  mA)
- . High failsafe output signal ( $\geq 21$  mA)

### **Supply Voltage:**

- . U min = 10 Vdc
- . U max = 30 Vdc (intrinsic safety)
- . U max = 40 Vdc for AO\_1 ; 30 Vdc for AO\_2 (flameproof envelope)

**Supply Voltage Influence:** 0.1  $\mu$ V/V

## Performance Specifications

<b>Accuracy:</b>	$\pm 0.5$ %
<b>Hysteresis:</b>	0.3 %
<b>Repeatability:</b>	0.2 %
<b>Deadzone:</b>	0.1 %

(Performance is slightly below the normal performance as specified above for specific gravity below 0.2.)

## Electromagnetic Compatibility

Compliance with EMC Directive 2004/108/EC, including NF EN 61000-6-2, NF EN 61326-1, NF EN 61326-3-1, NF EN 61000-6-4 and NF EN 55022 standards.

## Over-voltage Protection (at 25°C / 77°F)

- . 10 kW for 8/20  $\mu$ s pulse wave form
- . 1.5 kW for 10/1000  $\mu$ s pulse wave form

# Hazardous Location Protection

## ATEX & IECEx Approvals (94/9/EC Directive)

### Explosionproof

- II 2 G/D
- Ex d IIC T6, T5 or T4
- Ex tD A21 IP66/67 T85°C, T100°C or T135°C

### Intrinsic safety

- II 1 G/D
- Ex ia IIC T6, T5 or T4
- Ex iaD 20 T85°C, T100°C or T135°C
- IP 66/67
- II 3 G
- Ex nL IIC T6, T5 or T4

## FM and FMc Approvals (Factory Mutual and Factory Mutual Canada)

### Explosionproof

- Class I ; Division 1 & 2
- Groups B, C, D
- T6 or T5

### Dust-ignitionproof

- Class II & III ; Division 1 & 2
- Groups E, F, G
- T6 or T5

### Intrinsically safe

- Class I, II, III ; Division 1 & 2
- Groups A, B, C, D, E, F, G
- T6, T5 or T4

### Non-incendive

- Class I, II, III ; Division 2
- Groups A, B, C, D, F, G
- T6 or T5

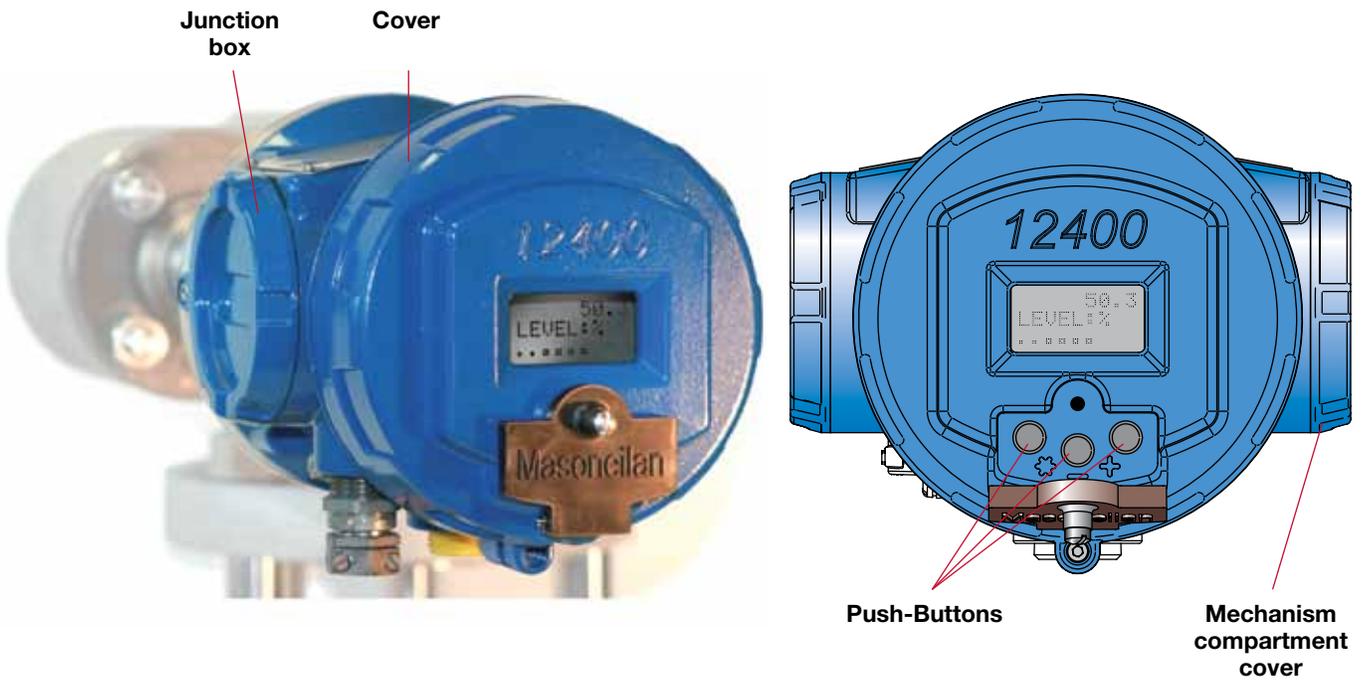
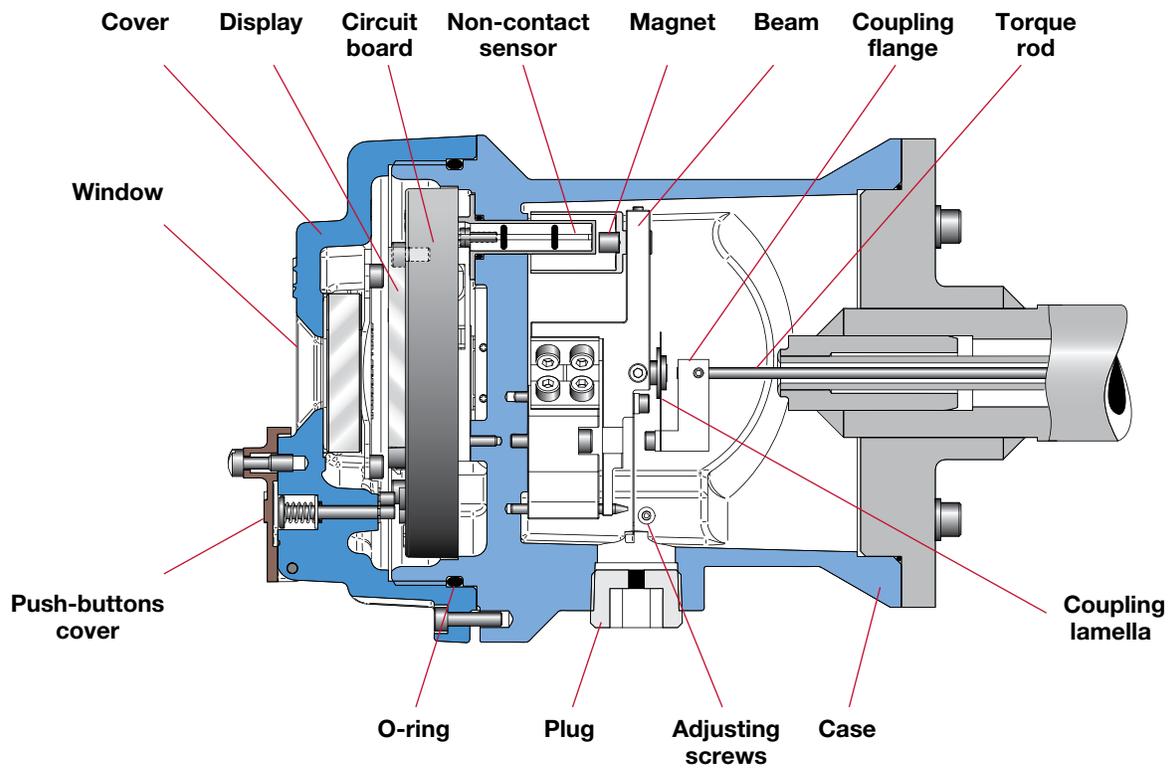
## Other approvals:

- BKI (Hungary)
- GOSGORTECHNADZOR (Russia)
- JIS (Japan)
- KOSHA (Korea)
- CCOE (India)
- FTZU (Czech Republic)

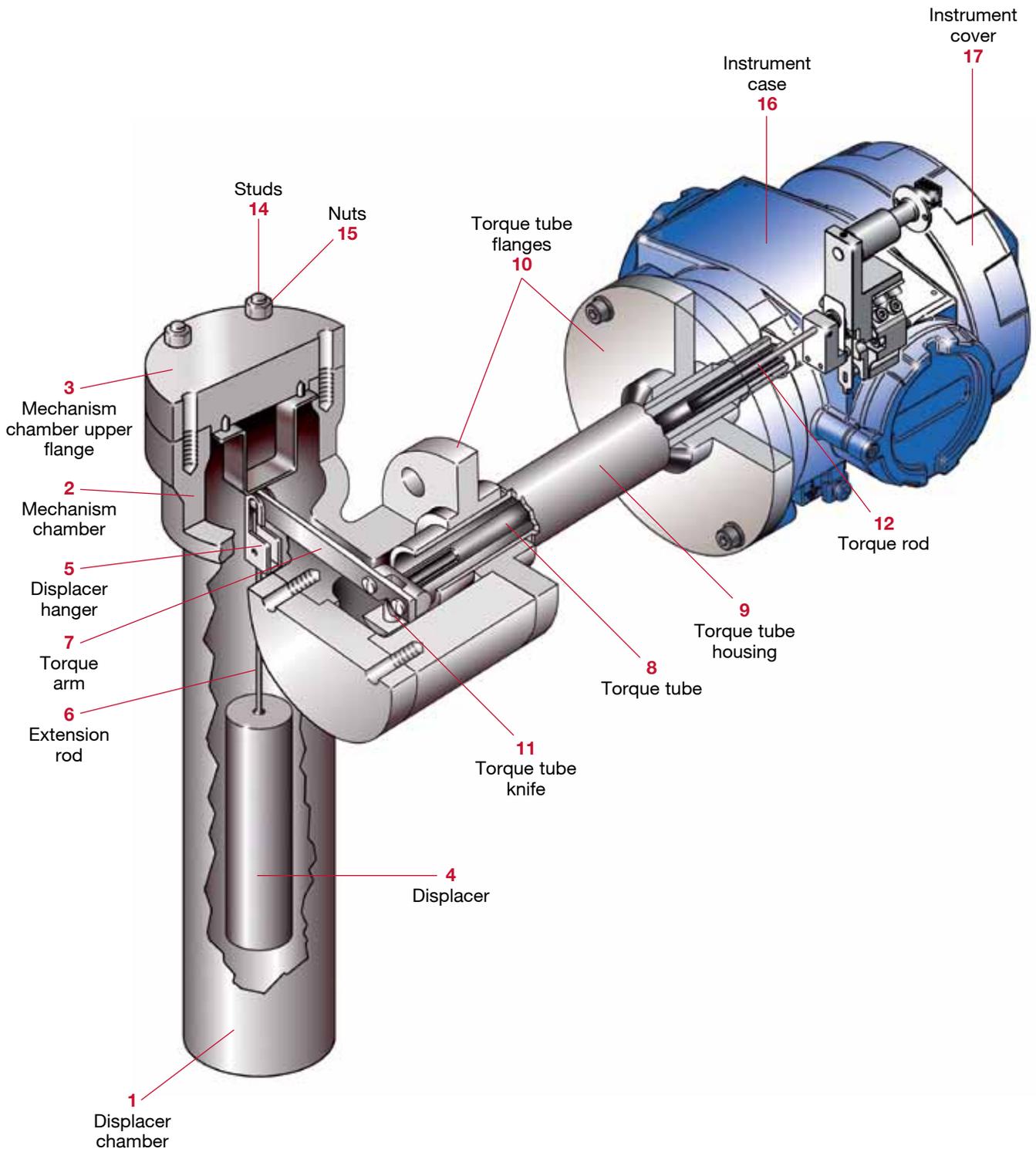
## Enclosure Rating

- IP 66 / IP 67
- NEMA 4X - 6P

# Case Sketch



# Materials of Construction



## Materials of Construction

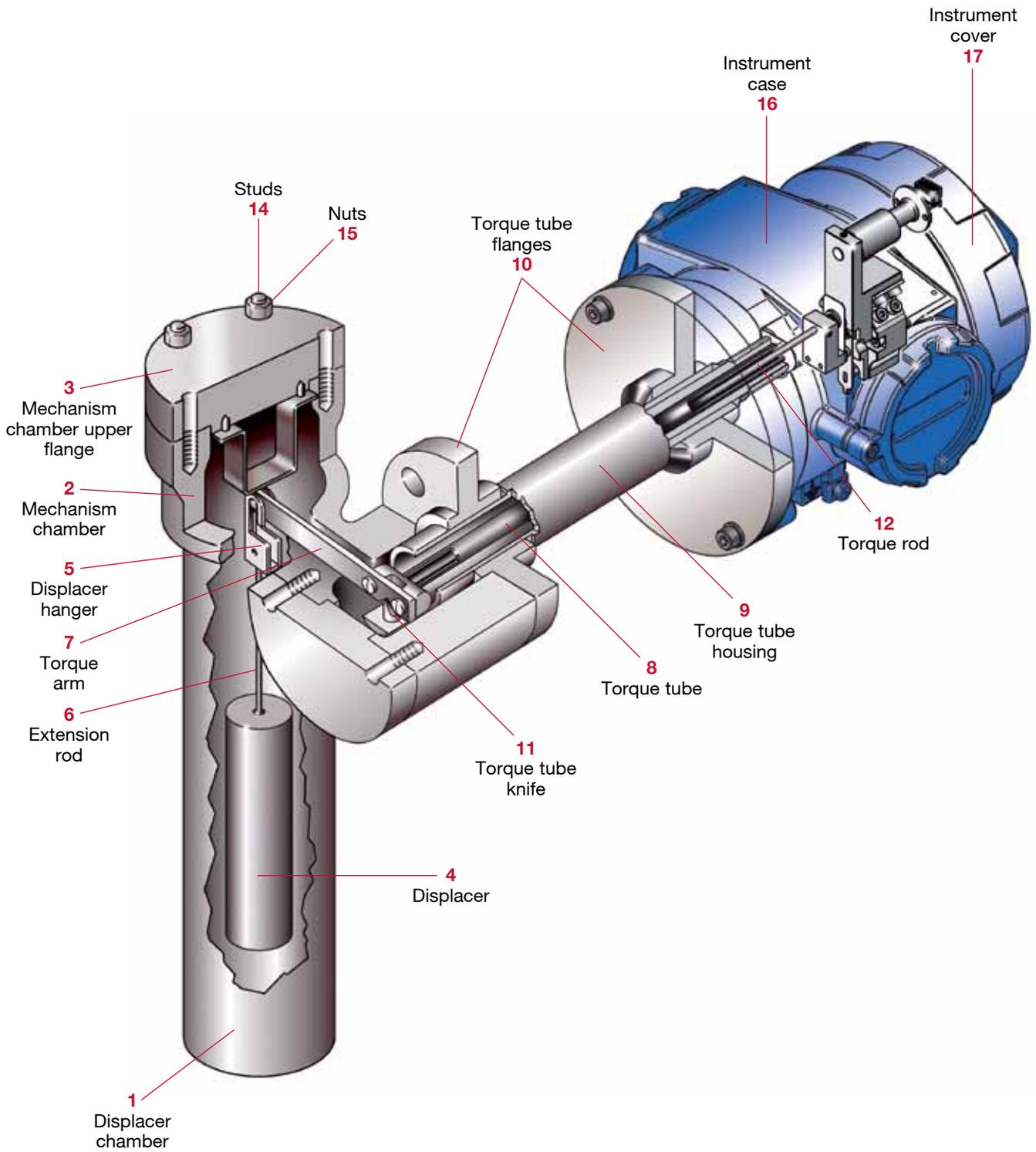
<b>Carbon Steel Construction</b>		
<b>1</b>	Displacer chamber (tube)	ASTM A 106 Gr B (300/600 lbs) / 1.0425 EN 10216-2 (900/1500 lbs)
<b>2</b>	Mechanism chamber	ASTM A 216 Gr WCC / 1.0625 EN 10213-2
<b>3</b>	Mechanism chamber upper flange	Flanged: ASTM A 216 Gr WCC / 1.0625 EN 10213-2 Others: ASTM A 105 / 1.0481 EN 10273
<b>4</b>	Displacer	ASTM A 312 Ty 316L
<b>5</b>	Displacer hanger	ASTM A 240 Ty 316L
<b>6</b>	Extension rod	ASTM A 479 Ty 316L
<b>7</b>	Torque arm	ASTM A 479 Ty 316L
<b>8</b>	Torque tube	Inconel 600
<b>9</b>	Torque tube housing	ASTM A 106 Gr B / 1.0425 EN
<b>10</b>	Torque tube flanges (mechanism chamber and instrument sides)	ASTM A 105 / 1.0481 EN 10273
<b>11</b>	Torque tube knife	ASTM A 479 Ty 316L
<b>12</b>	Torque rod	Inconel 600
<b>13</b>	Gaskets (torque tube, flanges)	AISI 316L + Graphite
<b>14</b>	Studs	ASTM A 193 Gr B7 / 1.7225 EN 10269 zinc bichromate plated
<b>15</b>	Nuts	ASTM A 194 Gr 2H zinc bichromate plated
<b>16</b>	Instrument case	Anodized cast aluminium, with epoxy painting
<b>17</b>	Instrument cover	Anodized cast aluminium, with epoxy painting

Note: Many other materials are available as option: alloy steels, K-Monel, Hastelloy... Please consult Dresser Masoneilan.

<b>«NACE» Carbon Steel Constructions (exposed and non exposed bolting)</b>		
<b>1</b>	Displacer chamber (tube)	ASTM A 106 Gr B (300/600 lbs) / 1.0425 EN 10216-2 (900/1500 lbs)
<b>2</b>	Mechanism chamber	ASTM A 216 Gr WCC / 1.0625 EN 10213-2
<b>3</b>	Mechanism chamber upper flange	Flanged: ASTM A 216 Gr WCC / 1.0625 EN 10213-2 Others: ASTM A 105 / 1.0481 EN 10273
<b>4</b>	Displacer	ASTM A 312 Ty 316L
<b>5</b>	Displacer hanger	ASTM A 240 Ty 316L
<b>6</b>	Extension rod	ASTM A 479 Ty 316L
<b>7</b>	Torque arm	ASTM A 479 Ty 316L
<b>8</b>	Torque tube	Inconel 600
<b>9</b>	Torque tube housing	ASTM A 106 Gr B / 1.0425 EN
<b>10</b>	Torque tube flanges (mechanism chamber and instrument sides)	ASTM A 105 / 1.0481 EN 10273
<b>11</b>	Torque tube knife	ASTM A 479 Ty 316L
<b>12</b>	Torque rod	Inconel 600
<b>13</b>	Gaskets (torque tube, flanges)	AISI 316L + Graphite
<b>14</b>	Studs	Exposed: ASTM A 193 Gr B7M zinc bichromate plated Non exposed: ASTM A 193 Gr B7 / 1.7225 EN 10269 zinc bichromate plated
<b>15</b>	Nuts	Exposed: ASTM A 194 GR 2HM zinc bichromate plated Non exposed: ASTM A 194 GR 2H zinc bichromate plated
<b>16</b>	Instrument case	Anodized cast aluminium, with epoxy painting
<b>17</b>	Instrument cover	Anodized cast aluminium, with epoxy painting

Note: Standard materials and processes are in accordance with the requirements of NACE specification MR0103. Applications requiring compliance to MR0175-2003 or ISO 15156 must be reviewed by Dresser Masoneilan.

# Materials of Construction



## Materials of Construction

<b>Stainless Steel Construction</b>		
<b>1</b>	Displacer chamber (tube)	ASTM A 312 Ty 316 / 1.4401 EN
<b>2</b>	Mechanism chamber	ASTM A 351 Gr CF8M / 1.4408 EN 10213
<b>3</b>	Mechanism chamber upper flange	Flanged: ASTM A 351 Gr CF8M / 1.4408 EN 10213 Others: 1.4401 EN 10272
<b>4</b>	Displacer	ASTM A 312 Ty 316L
<b>5</b>	Displacer hanger	ASTM A 240 Ty 316L
<b>6</b>	Extension rod	ASTM A 479 Ty 316L
<b>7</b>	Torque arm	ASTM A 479 Ty 316L
<b>8</b>	Torque tube	Inconel 600
<b>9</b>	Torque tube housing	ASTM A 312 Ty 316 / 1.4404 EN
<b>10</b>	Torque tube flanges (mechanism chamber and instrument sides)	1.4401 EN 10272
<b>11</b>	Torque tube knife	ASTM A 479 Ty 316L
<b>12</b>	Torque rod	Inconel 600
<b>13</b>	Gaskets (torque tube, flanges)	AISI 316L + Graphite
<b>14</b>	Studs	ASTM A 193 Gr B8 Cl. 2
<b>15</b>	Nuts	ASTM A 194 Gr 8
<b>16</b>	Instrument case	Anodized cast aluminium, with epoxy painting
<b>17</b>	Instrument cover	Anodized cast aluminium, with epoxy painting

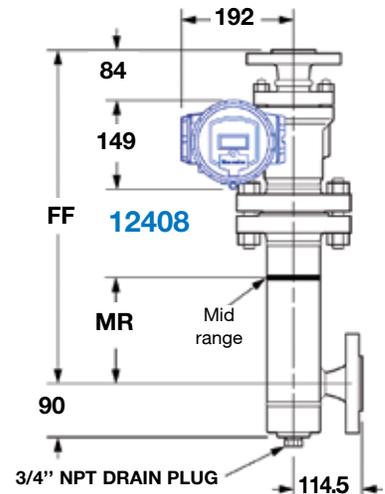
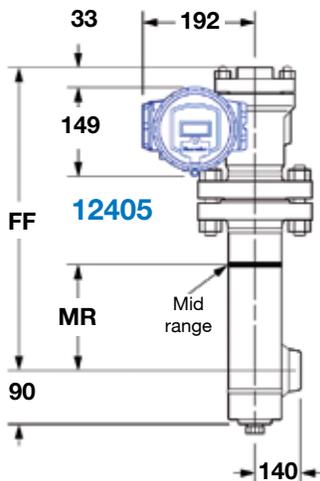
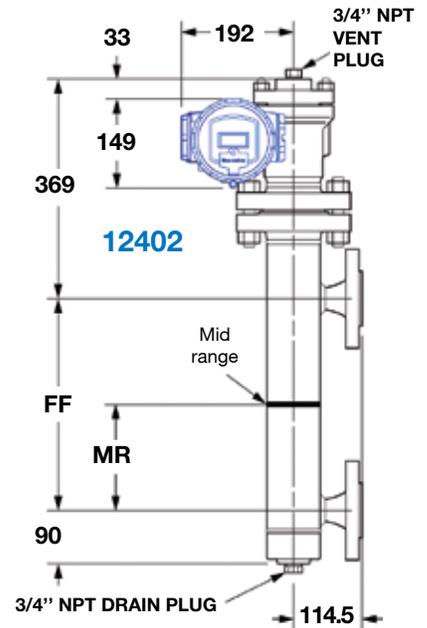
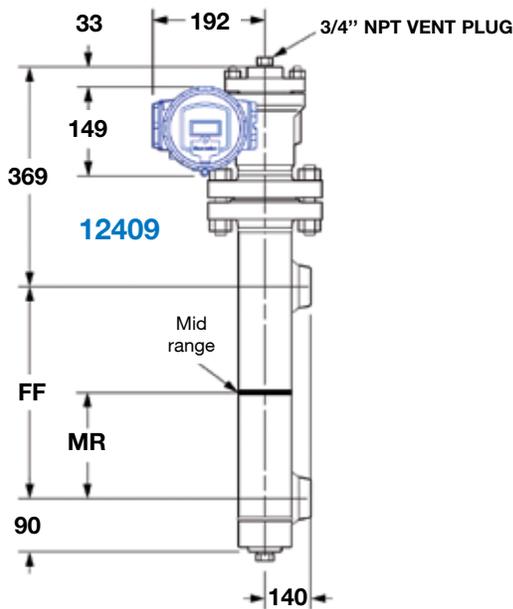
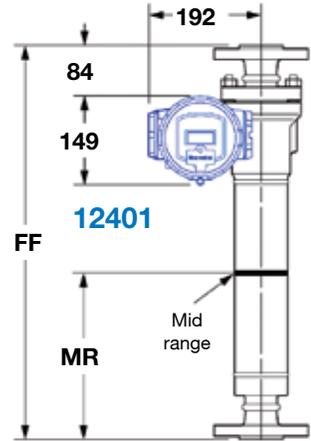
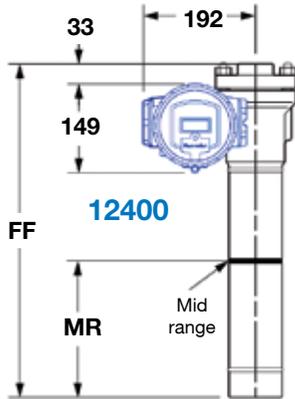
Note: Many other materials are available as option: alloy steels, K-Monel, Hastelloy... Please consult Dresser Masoneilan.

<b>«NACE» Stainless Steel Constructions (exposed and non exposed bolting)</b>		
<b>1</b>	Displacer chamber (tube)	ASTM A 312 Ty 316 / 1.4401 EN
<b>2</b>	Mechanism chamber	ASTM A 351 Gr CF8M / 1.4408 EN 10213
<b>3</b>	Mechanism chamber upper flange	Flanged: ASTM A 351 Gr CF8M / 1.4408 EN 10213 Others: 1.4401 EN 10272
<b>4</b>	Displacer	ASTM A 312 Ty 316L
<b>5</b>	Displacer hanger	ASTM A 240 Ty 316L
<b>6</b>	Extension rod	ASTM A 479 Ty 316L
<b>7</b>	Torque arm	ASTM A 479 Ty 316L
<b>8</b>	Torque tube	Inconel 600
<b>9</b>	Torque tube housing	ASTM A 312 Ty 316 / 1.4404 EN
<b>10</b>	Torque tube flanges (mechanism chamber and instrument sides)	1.4401 EN 10272
<b>11</b>	Torque tube knife	ASTM A 479 Ty 316L
<b>12</b>	Torque rod	Inconel 600
<b>13</b>	Gaskets (torque tube, flanges)	AISI 316L + Graphite
<b>14</b>	Studs	Exposed: ASTM A 193 Gr B8M Cl 2 Non exposed: ASTM A 193 Gr B8 Cl2
<b>15</b>	Nuts	Exposed: ASTM A 194 Gr 8 MA Non exposed: ASTM A 194 Gr 8
<b>16</b>	Instrument case	Anodized cast aluminium, with epoxy painting
<b>17</b>	Instrument cover	Anodized cast aluminium, with epoxy painting

Note: Standard materials and processes are in accordance with the requirements of NACE specification MR0103. Applications requiring compliance to MR0175-2003 or ISO 15156 must be reviewed by Dresser Masoneilan.

# Dimensions (mm)

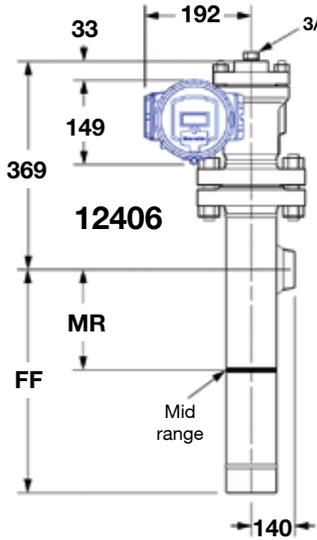
Models: **12400**, **12401**, **12409**, **12402**, **12405** & **12408**, ANSI 300-600 and PN 50-100



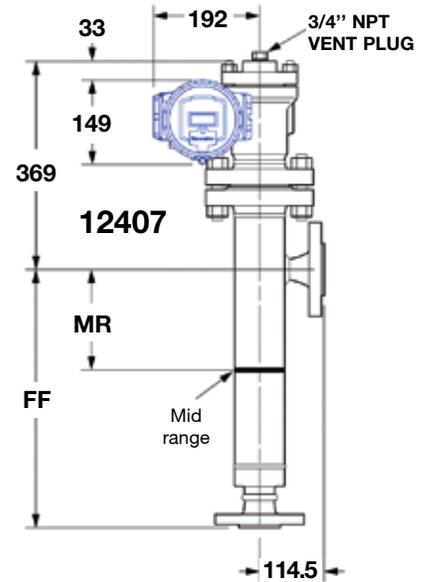
For ratings higher than ANSI 600 and PN 100, please consult Dresser Masoneilan. See page 18 for Top view.

# Dimensions (mm)

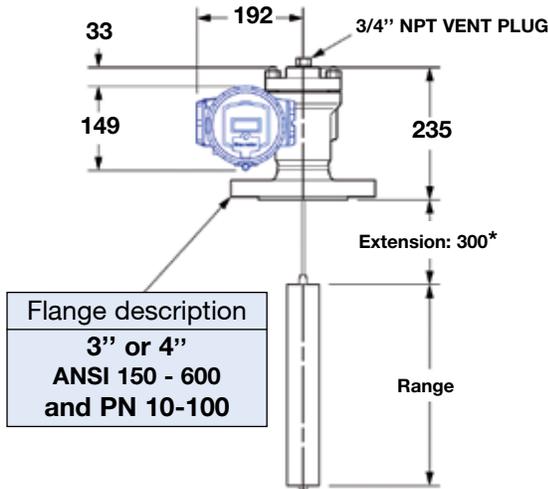
**Models: 12406, 12407, 12403 & 12404, ANSI 150-600 and PN 50-100**



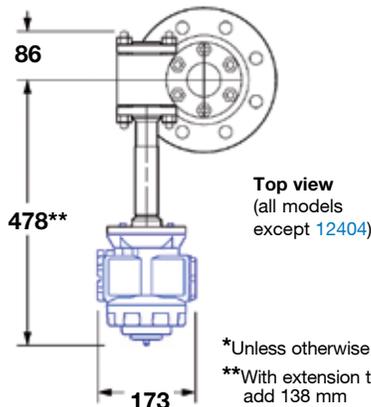
12406		RANGE		12407	
FF	MR	inch	mm	FF	MR
418	178	14	356	457	178
673	305	24	610	711	305
876	406	32	813	914	406
1282	610	48	1219	1321	610
1587	762	60	1524	1626	762
1892	914	72	1829	1930	914
2196	1067	84	2134	2235	1067
2501	1219	96	2438	2540	1219
3111	1524	120	3048	3150	1524



## 12403



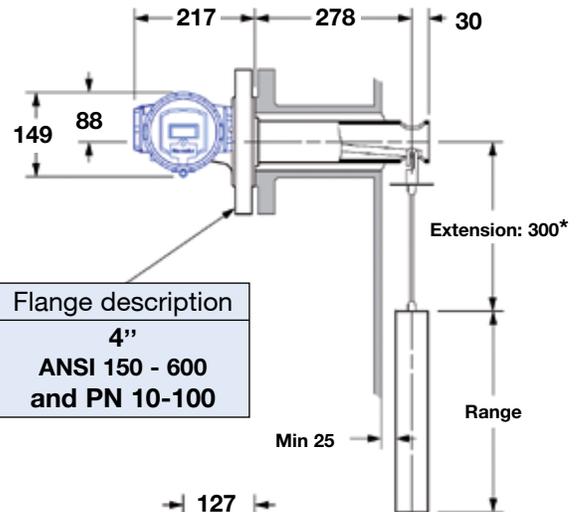
Flange description  
3" or 4"  
ANSI 150 - 600  
and PN 10-100



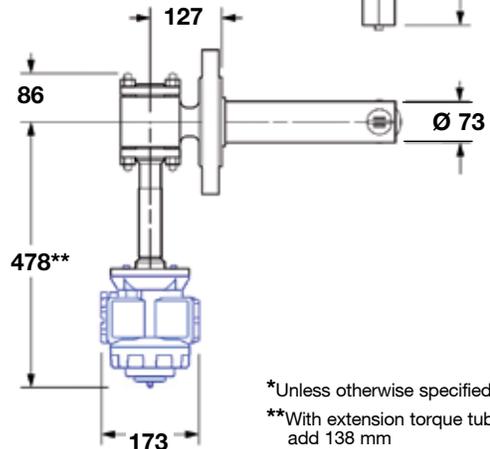
Top view  
(all models  
except 12404)

\*Unless otherwise specified  
\*\*With extension torque tube,  
add 138 mm

## 12404



Flange description  
4"  
ANSI 150 - 600  
and PN 10-100

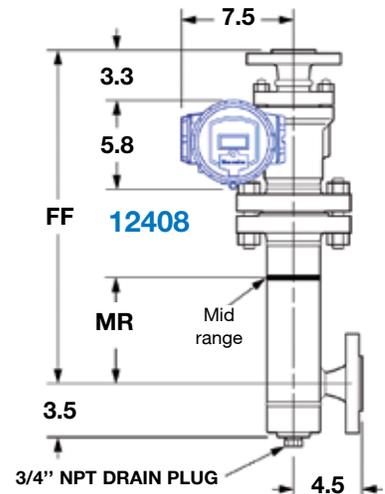
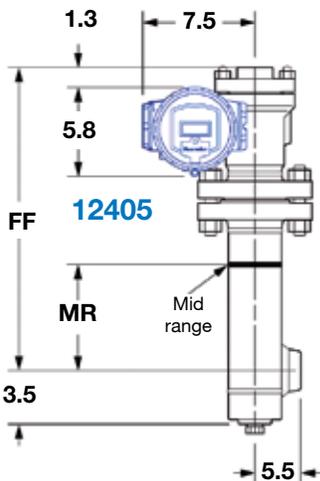
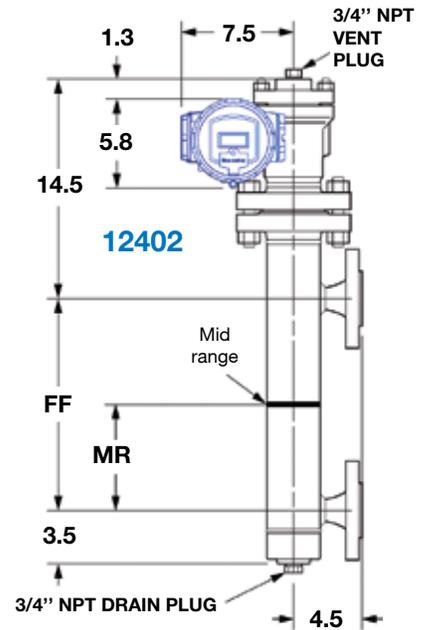
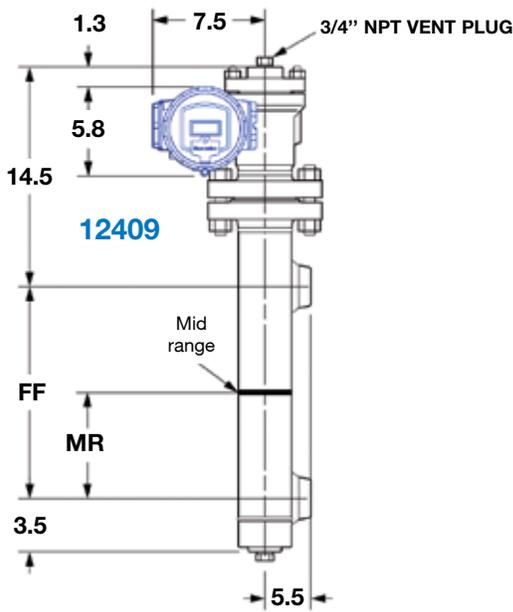
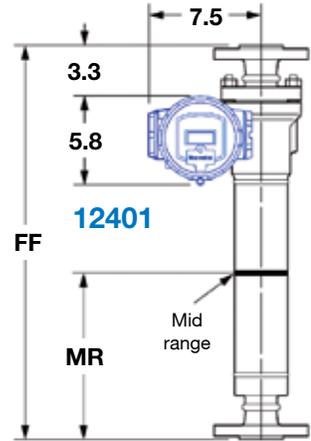
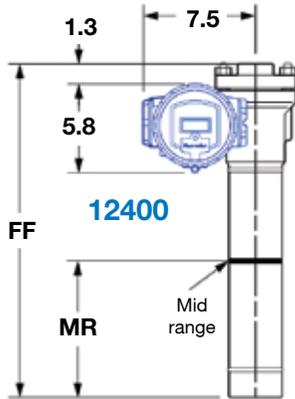


\*Unless otherwise specified  
\*\*With extension torque tube,  
add 138 mm

For ratings higher than ANSI 600 and PN 100, please consult Dresser Masonellan. See page 18 for Top view.

# Dimensions (inches)

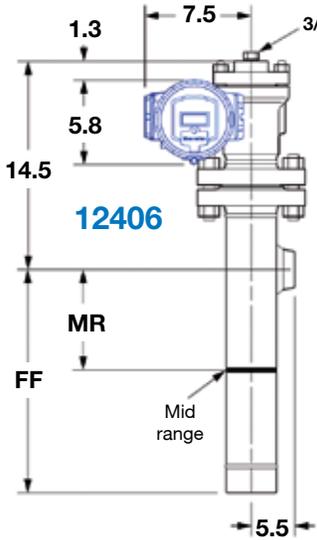
Models: **12400**, **12401**, **12409**, **12402**, **12405** & **12408**, ANSI 300-600 and PN 50-100



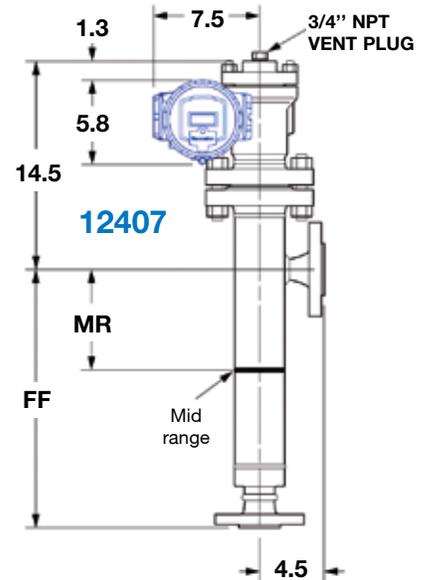
For ratings higher than ANSI 600 and PN 100, please consult Dresser Masoneilan. See page 18 for Top view.

# Dimensions (inches)

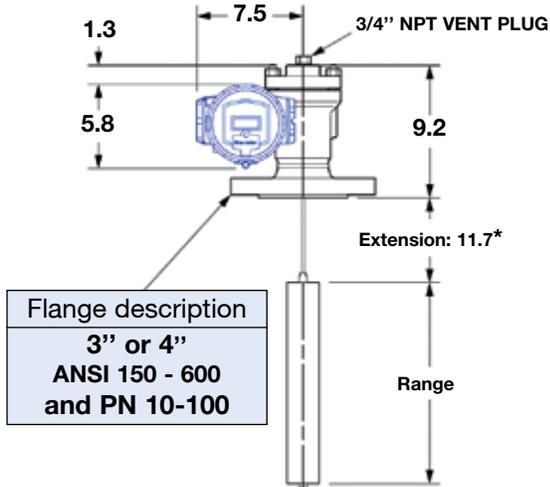
**Models: 12406, 12407, 12403 & 12404, ANSI 150-600 and PN 50-100**



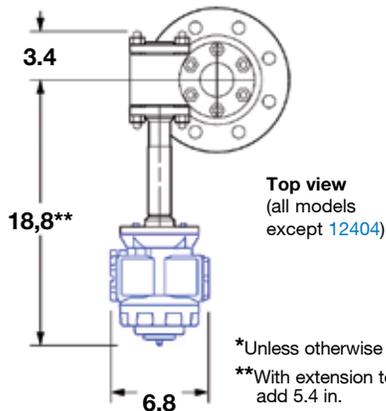
12406		RANGE		12407	
FF	MR	inch	mm	FF	MR
16	7	14	356	18	7
26	12	24	610	28	12
34	16	32	813	36	16
50	24	48	1219	52	24
62	30	60	1524	64	30
74	36	72	1829	76	36
86	42	84	2134	88	42
98	48	96	2438	100	48
122	60	120	3048	124	60



## 12403

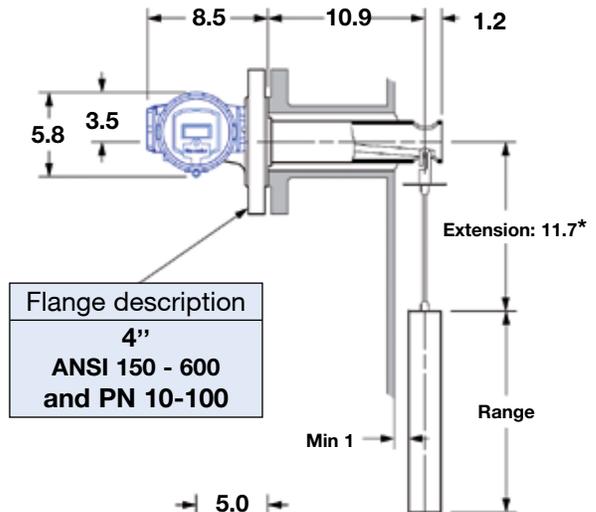


Flange description  
3" or 4"  
ANSI 150 - 600  
and PN 10-100

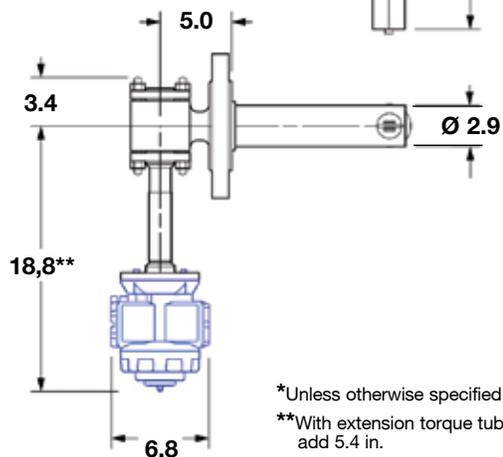


\*Unless otherwise specified  
\*\*With extension torque tube, add 5.4 in.

## 12404



Flange description  
4"  
ANSI 150 - 600  
and PN 10-100



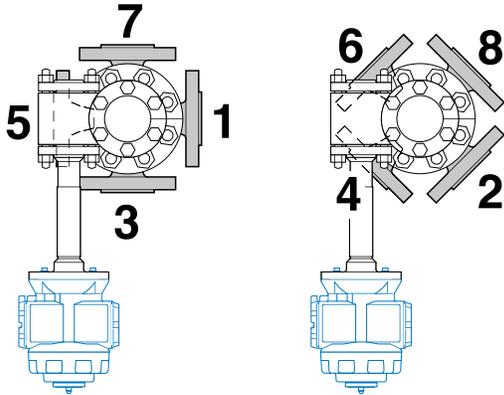
\*Unless otherwise specified  
\*\*With extension torque tube, add 5.4 in.

For ratings higher than ANSI 600 and PN 100, please consult Dresser Masonellan. See page 18 for Top view.

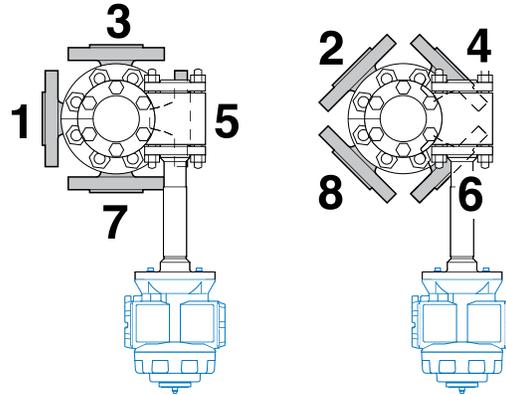
# Orientation

**Models: 12402, 12405, 12406, 12407, 12408 & 12409**

**Left hand instrument mounting**



**Right hand instrument mounting**



Note: Unless otherwise specified, the case will be position 1 left-mounted

## Weight (lbs)

**Models: ANSI 600 and PN 100**

Model	Level ranges								
	356 mm 14"	610 mm 24"	813 mm 32"	1219 mm 48"	1524 mm 60"	1829 mm 72"	2134 mm 84"	2438 mm 96"	3048 mm 120"
12400	79	90	90	101	108	117	123	130	146
12401	90	101	101	112	119	128	135	141	157
12409	112	123	123	135	141	150	157	163	179
12402	121	132	132	143	150	159	165	172	187
12405	110	121	121	132	139	148	154	161	176
12408	119	130	130	141	148	157	163	170	185
12406	110	121	121	132	139	148	154	161	176
12407	121	132	132	143	150	159	165	172	187
12403	88	88	88	88	88	88	88	88	88
12404	88	88	88	88	88	88	88	88	88

## Weight (kg)

**Models: ANSI 600 and PN 100**

Model	Level ranges								
	356 mm 14"	610 mm 24"	813 mm 32"	1219 mm 48"	1524 mm 60"	1829 mm 72"	2134 mm 84"	2438 mm 96"	3048 mm 120"
12400	36	41	41	46	49	53	56	59	66
12401	41	46	46	51	54	58	61	64	71
12409	51	56	56	61	64	68	71	74	81
12402	55	60	60	65	68	72	75	78	85
12405	50	55	55	60	63	67	70	73	80
12408	54	59	59	64	67	71	74	77	84
12406	50	55	55	60	63	67	70	73	80
12407	55	60	60	65	68	72	75	78	85
12403	40	40	40	40	40	40	40	40	40
12404	40	40	40	40	40	40	40	40	40

# Specification Data



## 12400 SERIES HART LEVEL TRANSMITTER/CONTROLLER

CUSTOMER :

Reference :

QUOTATION N°

PAGE : /

REVISION :

DATE :

ITEM :	Qty :	NO SERVICE CONDITIONS <input type="checkbox"/>	UNITS	LOWER FLUID	UPPER FLUID		
		STATE		LIQUID	LIQUID <input type="checkbox"/> GAS/VAPOR <input type="checkbox"/>		
TAG :		FLUID					
		SPECIFIC GRAVITY					
SERVICE :		TEMPERATURE		MINI	NORM		
		PRESSURE		MINI	NORM		
				MAXI	MAXI		
RANGE				LEVEL AND AUXILIARY EQUIPMENT CODIFICATION			
356 mm (14")	610 mm (24")	813 mm (32")	1219 mm (48")	1 2 4			
LEVEL			OPT	LEVEL & AUXILIARY EQUIPMENT			
INSTRUMENT	WITHOUT INSTRUMENT			DISPLACER	WITHOUT DISPLACER		
	TRANSMITTER				MATERIAL	STAINLESS STEEL	
	CONTROLLER						
	CASE TYPE		WEATHERPROOF FLAMEPROOF INTRINSICALLY SAFE		HANGER EXTENSION (TOP AND SIDE VESSEL ONLY)	WITHOUT STANDARD (300 mm) SPECIAL (..... mm)	
	MOUNTING		LEFT HAND RIGHT HAND	VENT DRAIN	WITHOUT VENT + DRAIN DN 20 (3/4") NPT SCREWED + PLUG		
	CASE ORIENT.		POSITION NR .....		STANDARD CONSTRUCTION		
	SIGNALS		AO_1: 4-20mA AO_2 (option): 4-20mA DO_1 & DO_2 (option): 1A-30V		SPECIAL		
	ACTION		DIRECT REVERSE	HANDHELD COMMUNICATOR			
	ELECTRIC CONN.		1/2" NPT	VALVUE SOFTWARE			
	CABLE Ø						
TORQUE TUBE	WITHOUT TORQUE TUBE			REMARKS :			
	CHAMBER MATERIAL		CARBON STEEL STAINLESS STEEL				
	TORQUE TUBE MATERIAL		INCONEL STAINLESS STEEL				
	TEMPERATURE PROTECTION		STANDARD H.T. / L.T. EXTENSION				
	SINGLE FORCE						
	DOUBLE FORCE						
QUADRUPLE FORCE							
MECHANISM & DISPLACER CHAMBERS	WITHOUT MECHANISM AND DISPLACER CHAMBER						
	CONNECTIONS LAYOUT	WITH DISPLACER CHAMBER	TOP & BOTTOM				
			SIDE & SIDE SIDE & BOTTOM				
		WITHOUT CHAMBER	TOP & SIDE				
			TOP VESSEL SIDE VESSEL				
	ARM HOUSING LENGTH (SIDE VESSEL ONLY)		STD. LENGTH 11"				
	CONNECTIONS TYPE		FLANGED SCREWED BW/SW				
	CONNECTIONS DETAILS (IF FLANGED)	SIZE	DN 40 or DN 50 (1 1/2" or 2") WITH DISPLACER CH.				
			DN 80 or DN 100 (3" or 4") WITHOUT DISPLACER CH.				
		FACING & FINISH					
CHAMBERS MATERIAL		CARBON STEEL STAINLESS STEEL					
E. N°	UNIT PRICE :		TOTAL PRICE :				

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## About Dresser, Inc.

Dresser, Inc. is one of the leading providers of reliable, highly engineered infrastructure products for the global energy industry. Dresser's highly regarded portfolio of brands includes Wayne® payment and fueling systems; Waukesha® natural gas-powered engines and generator sets, Masoneilan® control valves, Consolidated® pressure relief valves, and Roots® blowers and compressors. With locations worldwide, Dresser, Inc. serves customers in more than 100 countries. [www.dresser.com](http://www.dresser.com).

## About Dresser Masoneilan

Dresser Masoneilan, headquartered in Houston, Texas, has been the leading global partner in process control valves and solutions for more than 100 years. A business segment of Dresser, Inc., the company delivers customized products, services and diagnostic solutions for oil and gas, process and power generation applications. [www.dresser.com](http://www.dresser.com)

## Dresser Masoneilan

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