



MP
metsonpower
TRANSFORMER ACCESSORIES

BUCHHOLZ RELAY —



Purchase orders should be given in accordance with the following chart.

Buchholz Relay Type

TYPE

MBR25 - V50 (DG - 25)
 MBR25 - F50 (DR - 25)
 MBR50 - F100 (DR - 50)
 MBR80 - F100 (DR - 80)

741
 751
 761
 771

UPPER CONTACT SYSTEM

Standart Reed Switch Normally Open (R-NO) 1
 Standart Reed Switch Normally Closed (R-NC) 2
 Changeover Reed Switch (W) 3
 Without Contact (0) 0

1
 2
 3
 0

LOWER CONTACT SYSTEM

Standart Reed Switch Normally Open (R-NO) 1
 Standart Reed Switch Normally Closed (R-NC) 2
 Changeover Reed Switch (W) 3

1
 2
 3

OIL FLOW SPEED SETTING

1,00 m / s
 1,50 m / s

2
 3

COLOR DESCRIPTION

RAL 1016
 RAL 7001
 RAL 7012
 RAL 7016
 RAL 7022
 RAL 7032
 RAL 7033
 RAL 7035
 RAL 7037
 RAL 7038
 RAL 9002

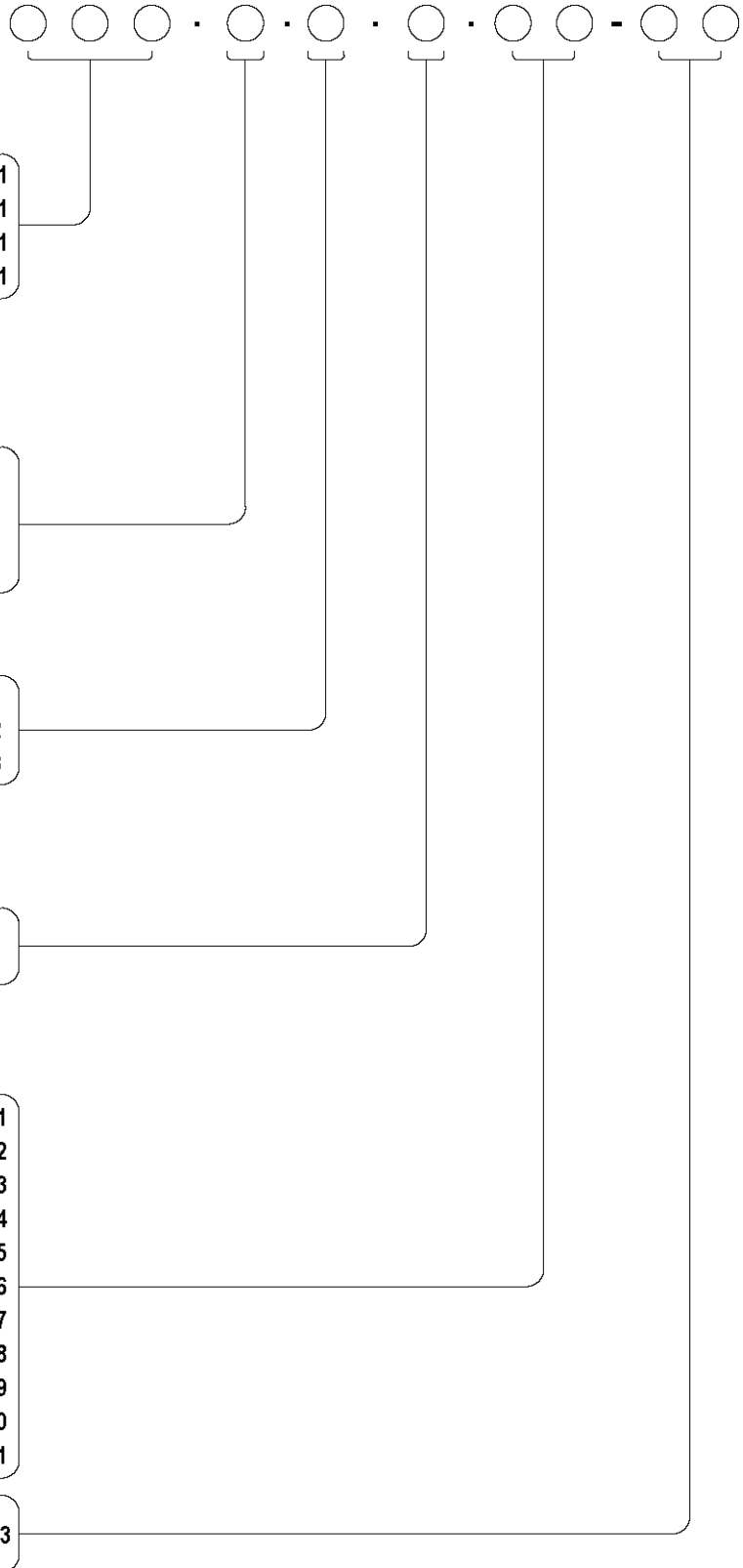
01
 02
 03
 04
 05
 06
 07
 08
 09
 10
 11

*(2 Normally Open Contact)

03

Example:

MBR25 - F50 : 751 . 1 . 1 . 2 . 01 - (01)



INTENDED USE OF BUCHHOLZ RELAY

On power and distribution transformers with oil conservator, protection relays manufactured by Buchholz principle are mounted between transformer tank and oil conservator and protects the transformer against the following conditions:

- 1- Against gas accumulations in the transformer,
- 2- Against potential oil leakages in the transformer,
- 3- Against oil surge which can occur during overheating situations caused by failures in transformers.

1- AGAINST GAS ACCUMULATIONS IN THE TRANSFORMERS

Two float systems exist in the Buchholz Relay. These two float systems activate dry type Reed switches connected to them. The float system which is at the Buchholz Relay's upper side activates the alarm reed switch. In case gas between 100cm³ and 300cm³ or 400cm³ amounts accumulate in the Buchholz Relay, or in case of an oil leakage with these amounts, the alarm switch is activated and sends a signal. As this alarm reed switch can be used as one normal open or two normal open, one switch can be used as changeover as well.

2- AGAINST POTENTIAL OIL LEAKAGES IN THE TRANSFORMER

As mentioned in item 1, when oil leakages that occur in the transformer are more than 100cm³, 300cm³ and 400cm³ the contact system connected to upper float activates and sends an alarm signal. If oil loss or oil leakage continues, the reed switch connected to the second float system in the Buchholz Relay activates and sends a signal. This signal means that the oil leakage in the transformer reached to critical level and there is not enough oil in the oil conservator to protect the transformer. Therefore this contact is called the "trip contact".

This is the contact used to deactivate the transformer. This contact working in connection to the lower float can be used as one or two or can be preferred as changeover reed switch as well.

3- OIL SURGE WHICH CAN OCCUR DURING OVERHEATING SITUATIONS CAUSED BY TRANSFORMER FAILURES

In case of overheating situations caused by transformer failures, if the oil flow rate (table - 1) in the Buchholz Relay exceeds the specified values, the lower float system described in item two is activated and sends a signal. This signal (trip) is also used to deactivate the transformer.

SAMPLE TAP

There is the sample tap over the Buchholz Relay. This tap allows taking oil from within the transformer and degassing the gasses accumulated in the relay as well. The tap is manufactured with glob valve principle in order to prevent gas leakage.

CONTROL & TEST BUTTON

Used to test if the contacts are working properly by moving the upper and lower floats in the Buchholz Relay up and down. Additionally, when the lower float is activated because of the oil flow rate, the signal doesn't disappear from the system unless the system is reset by the test button. The systems are reset and the signal disappears when the test button is pressed.

MATERIAL

Buchholz Relay casing, cover, terminal box cover, glass frame cover are produced from aluminum material and coated with electrostatic powder paint. The glasses on the relay are produced from tempered glass to make them stronger against breakage. Markings and graduations on the glass are written with special firing technique.

MOUNTING THE BUCHHOLZ RELAY TO THE TRANSFORMER

Buchholz Relay is intended to work in a horizontal position, it is connected with a 5° positive angle to the horizontal axis with the arrow mark on the relay pointing to the oil conservator. Buchholz Relays are manufactured to allow both thread and flange connections. Thread connections are manufactured as G1½A and appropriate connection types for flange connections are also shown in (Table 1).

Table1- STEADY OIL FLOW FOR THE RELAY TO WORK m/s

OIL TUBE CONNECTION INNER DIAMETERmm	STEADY OIL FLOW FOR THE RELAY TO WORK m/s	TOLERANCE
25	1	±15
50	1	±15
80	1 veya 1,5	±15

WORKING PRESSURE

Buchholz Relay is tested for an inner pressure of 50 kPA. In addition to that, it is tested with an extreme pressure of 250 kPA for 2 minutes.

MAGNETIC FIELD RESISTANCE

Buchholz Relays operate perfectly up to 25mT magnetic fields. Additionally, they are resistant to any d.c. field value at any direction and polarization.

WORKING CURRENTS

The working current is 2A. r.m.s and 30ms, The short circuit current is 10A. r.m.s.

SEPARATION AND CLOSING CAPACITY

VOLTAGE	CURRENT	SEPARATION CAPACITY	
48V -127 V d.c	2A	250W	L/R < 40ms
230 V a.c	2A	400 VA	cos φ > 0.5

TERMINAL BOX

In the terminal box, there is 1 earthing terminal and depending on the number of contacts there are 4 to 10 electric terminals. These electric terminals allow connection of cables with 1,5 and 4mm² cross sections. PG16 or M20X1,5 cable gland can be used for cable entry. Connection diagram of the electric terminals is shown on the electric terminal cover.

CASING

- 1 - Thread (B) and flange (A) connection types .
- 2 - Strong and specially graduated inspection glass.
- 3 - Inspection sight glass cover.

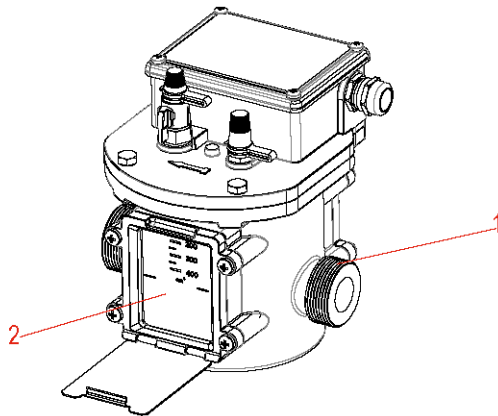


Figure B: casing with thread connection

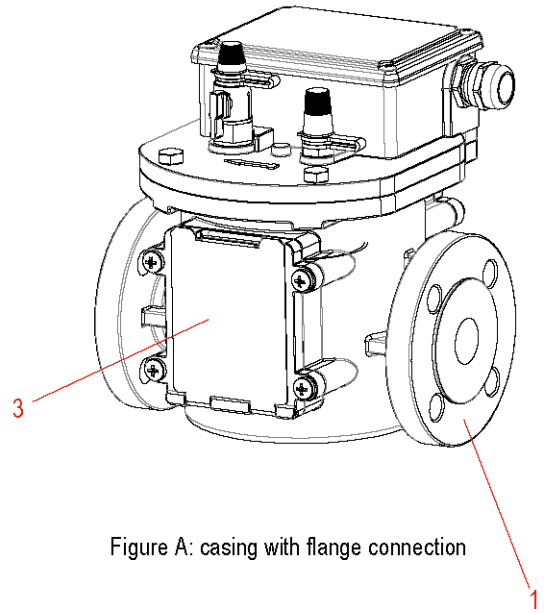
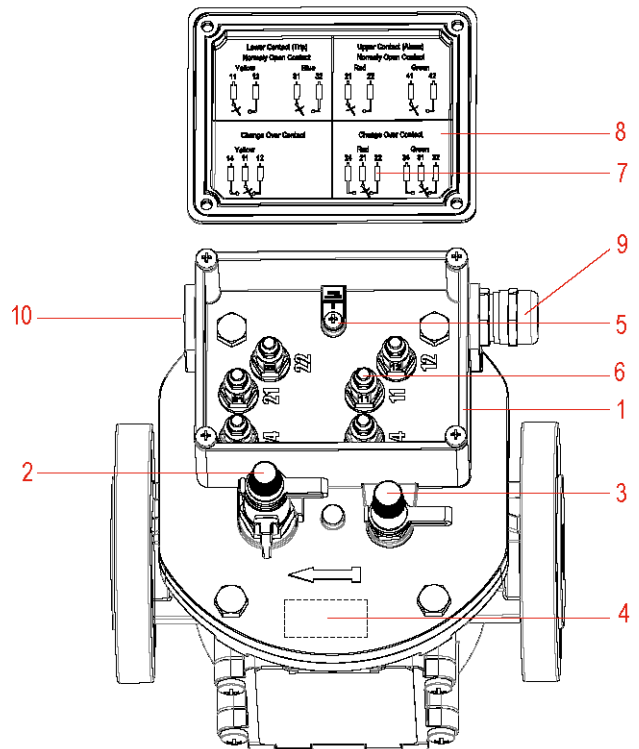
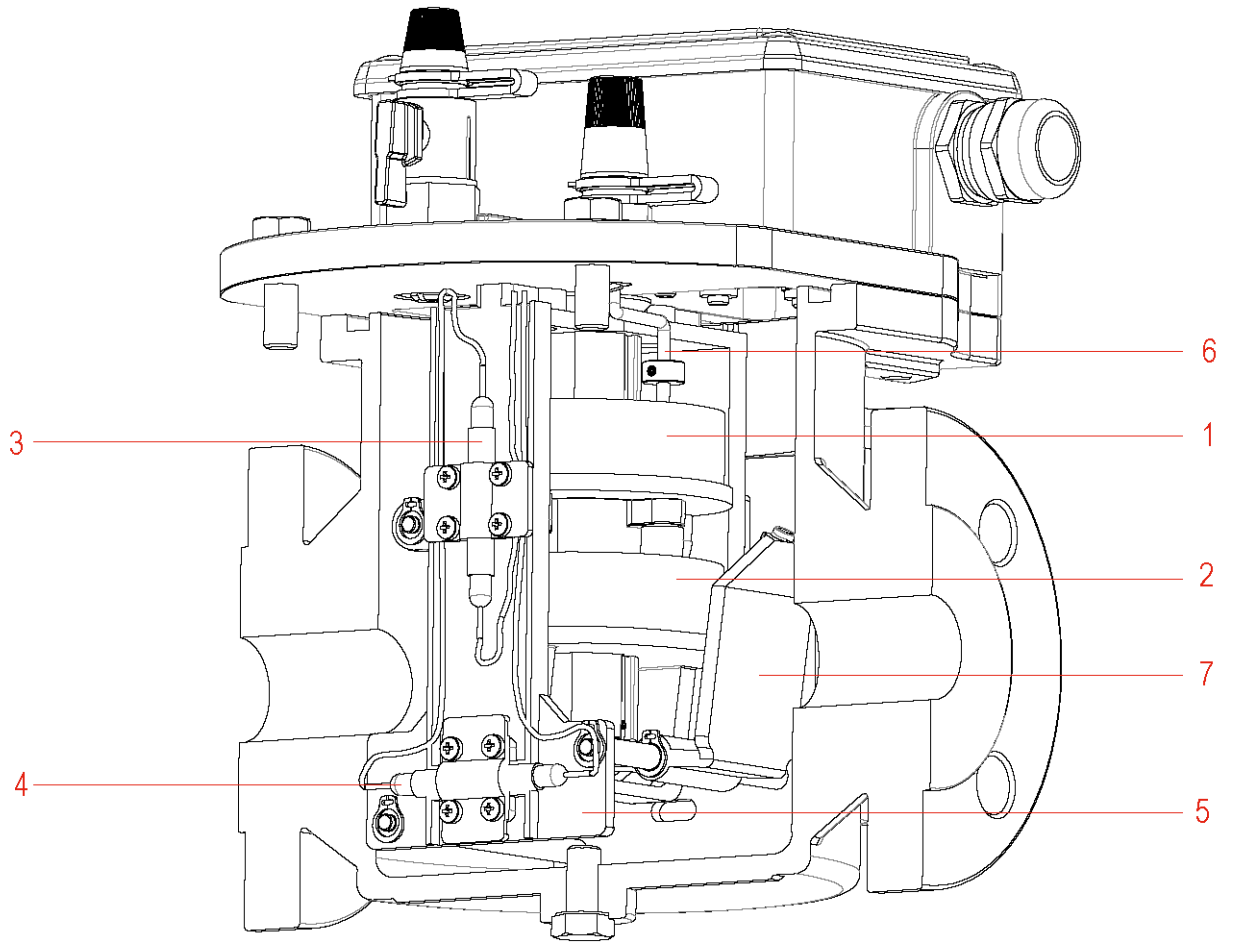


Figure A: casing with flange connection

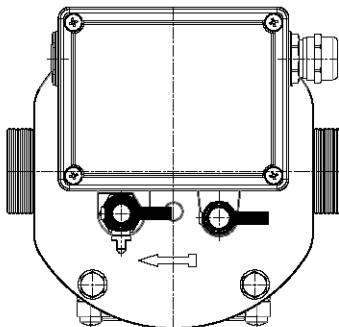
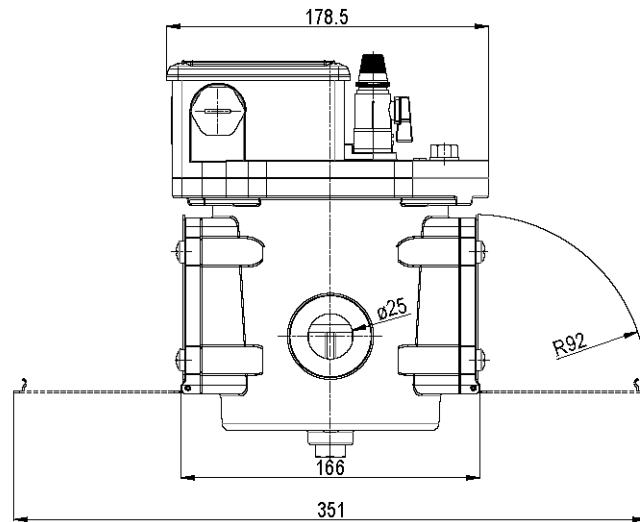
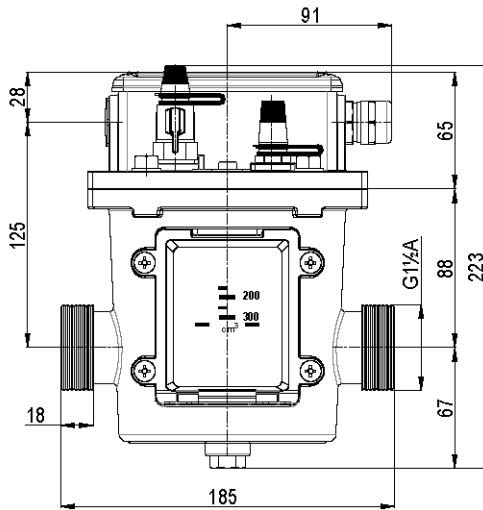
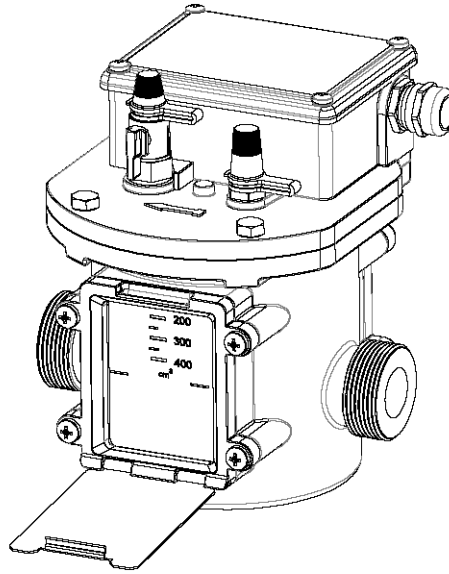
- 1 - Terminal box
- 2 - Sample tap
- 3 - Control & test button
- 4 - Product label area
- 5 - Earthing screw
- 6 - Electric terminal
- 7 - Electric terminal connection scheme
- 8 - Terminal box cover
- 9 - Cable coupling (PG16 or M20X1,5
- 10 - Blind plug



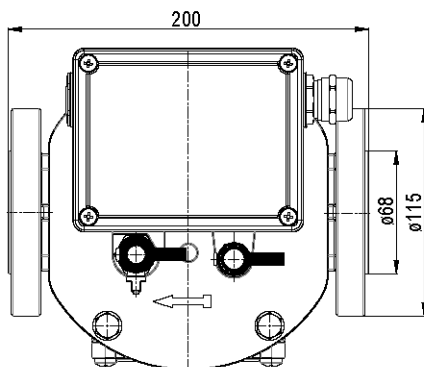
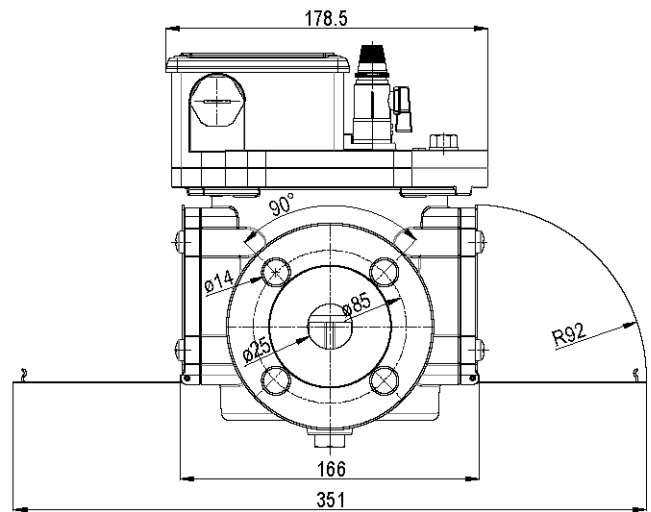
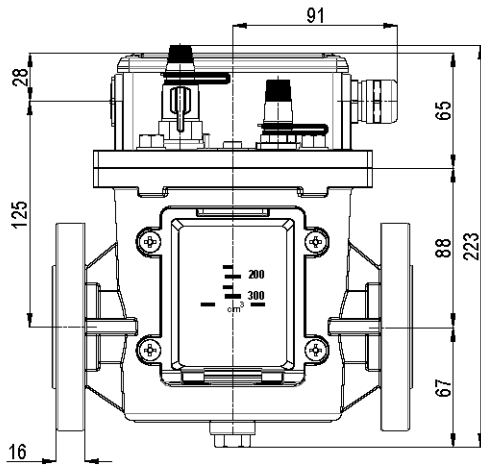
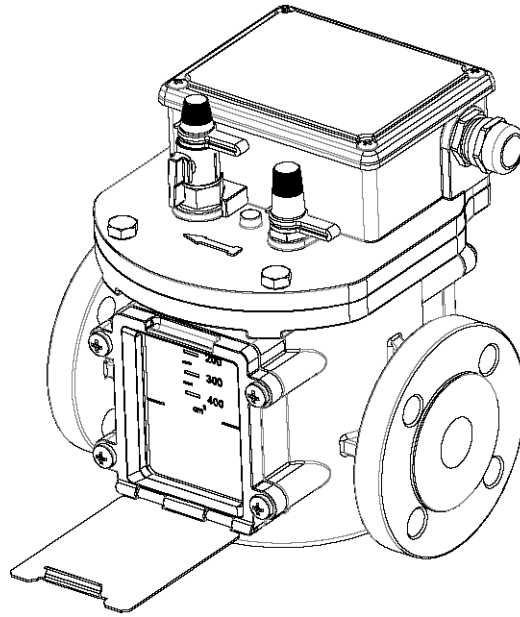
- 1 - Upper Float
- 2 - Lower Float
- 3 - Upper Reed Switch
- 4 - Lower Reed Switch
- 5 - Connection Hanger
- 6 - Control & Test Button
- 7 - Flow Speed Control Element



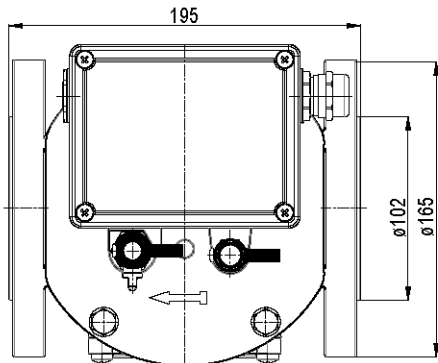
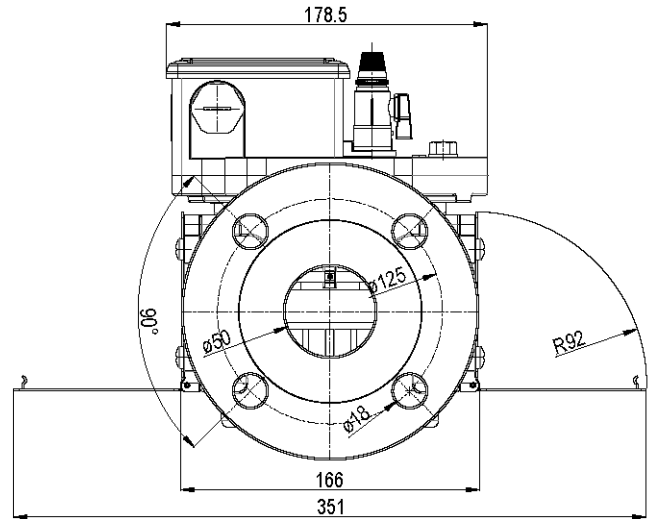
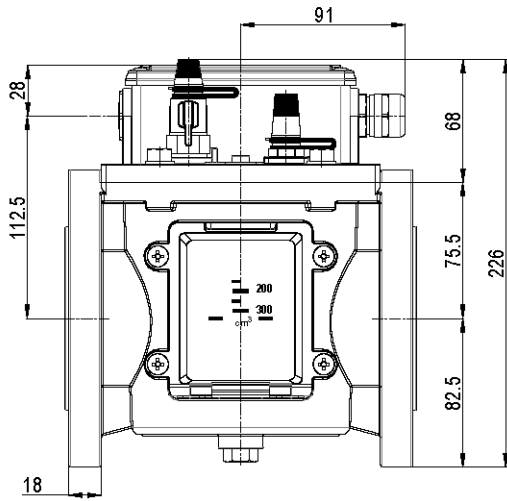
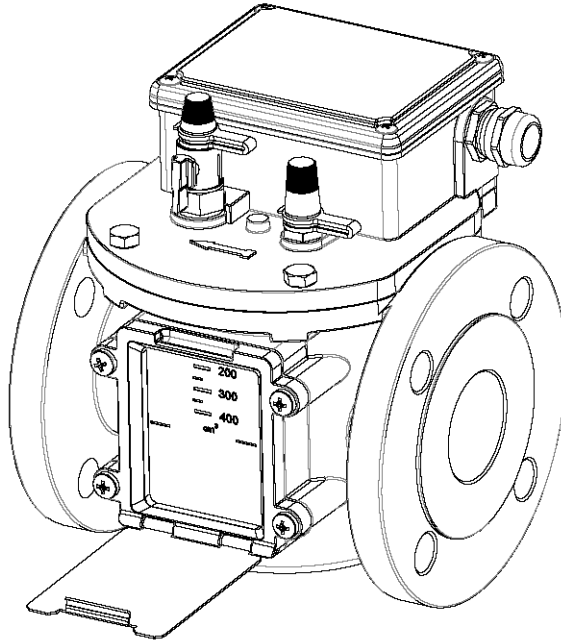
Type No DIN CODE	Type No DIN CODE	Connection	Nom. Pipesize (mm.) D1	Weight (kg.)	Transformer Power Class
741	MBR25 - V50 (DG -25) (EN 50216-2)	Screwed G 1 ½ A	25	3,9	≤ 5000 KVA



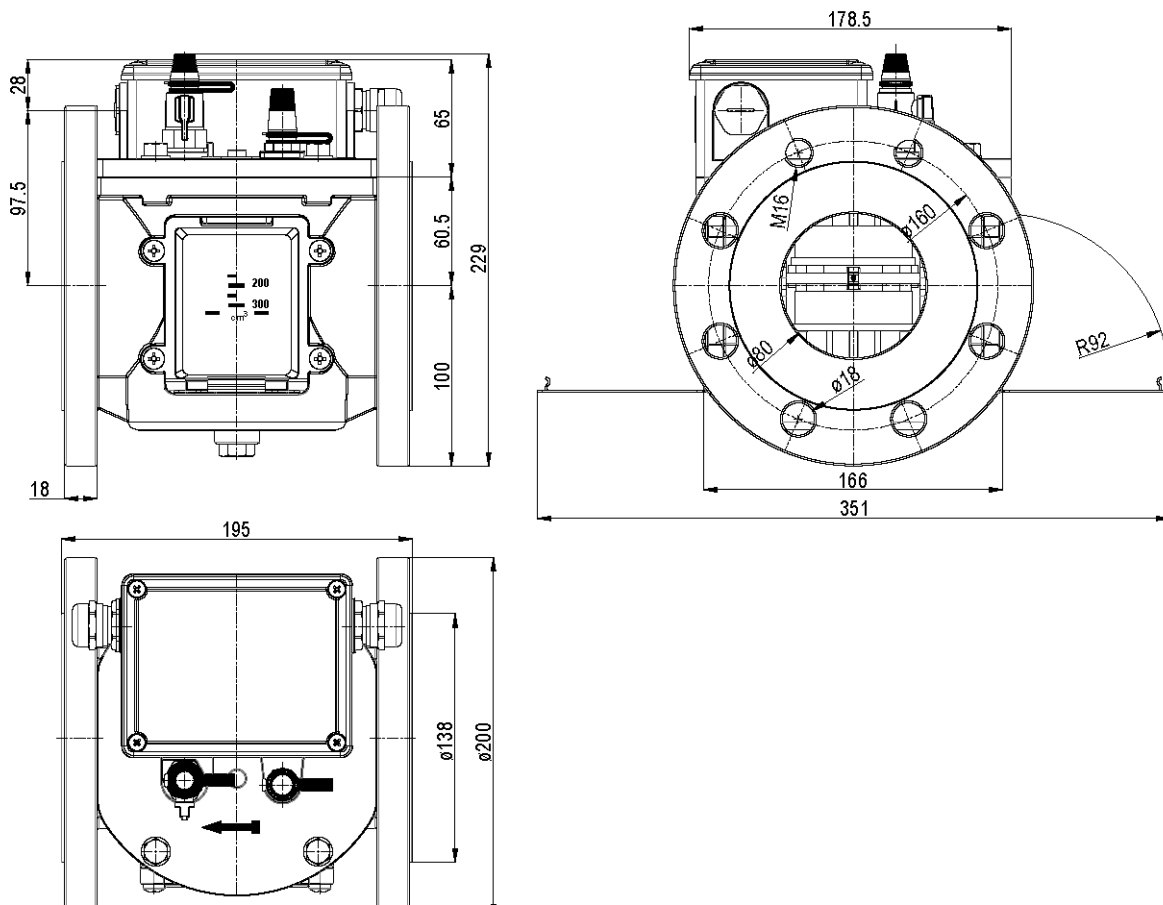
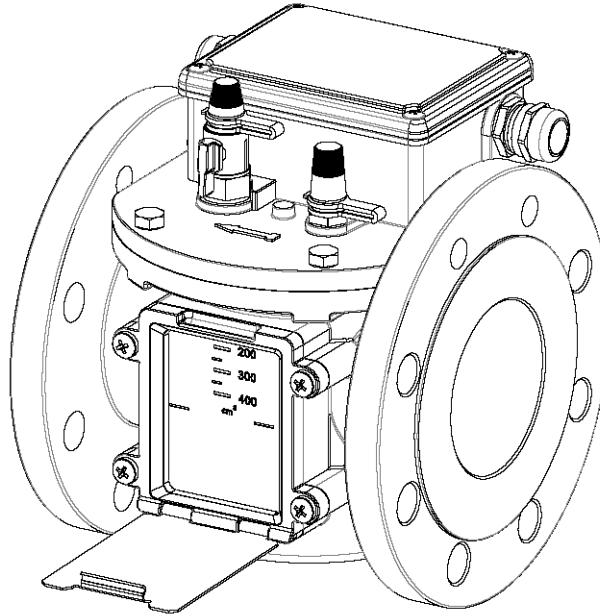
Type No DIN CODE	Type No DIN CODE	Connection	Nom. Pipesize (mm.) D1	Weight (kg.)	Transformer Power Class
751	MBR25 - F50 (DR -25) (EN 50216-2)	FLANGED	25	4,7	≤ 5000 KVA



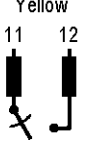

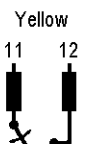
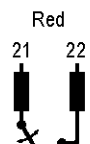
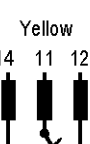
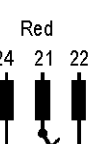
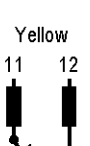
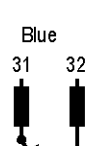

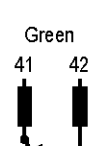
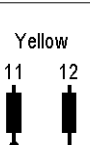
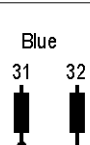

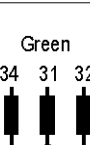
Type No DIN CODE	Type No DIN CODE	Connection	Nom. Pipesize (mm.) D1	Weight (kg.)	Transformer Power Class
761	MBR50 - F100 (DR -60) (EN 50216-2)	FLANGED	50	5,8	≥5000 KVA ≤10000 KVA

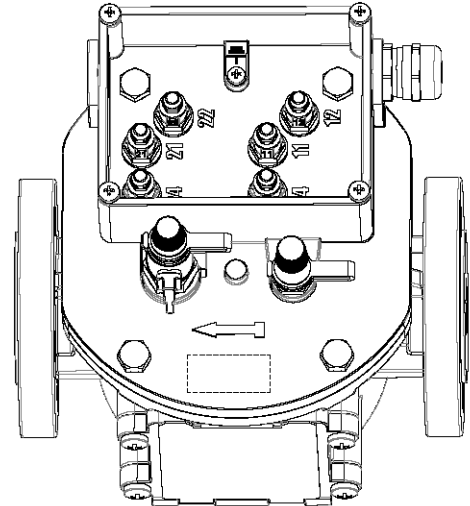
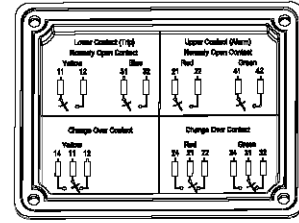


Type No DIN CODE	Type No DIN CODE	Connection	Nom. Pipesize (mm.) D1	Weight (kg.)	Transformer Power Class
771	MBR80 - F100 (DR -80) (DIN 42566)	FLANGED	80	6,5	≥10000 KVA

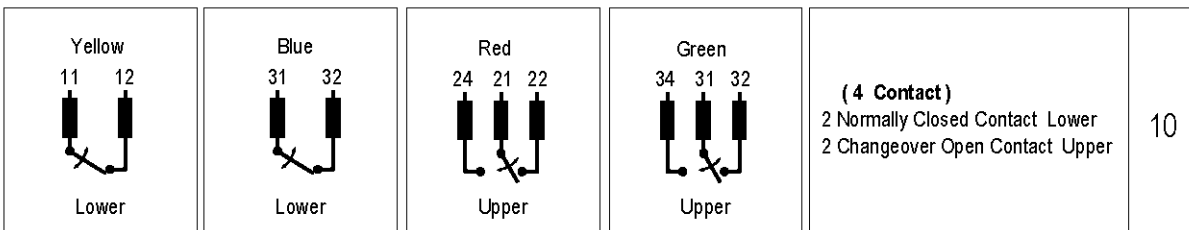
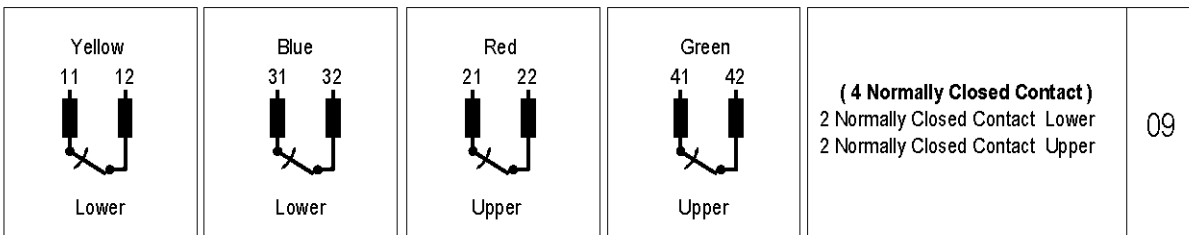
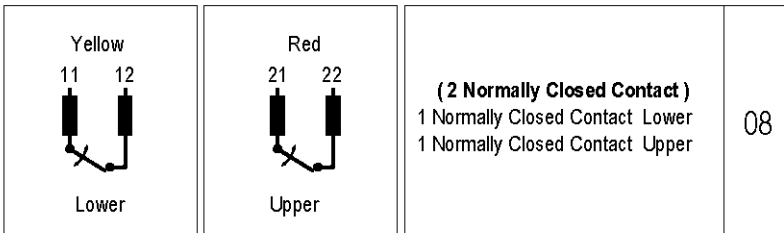
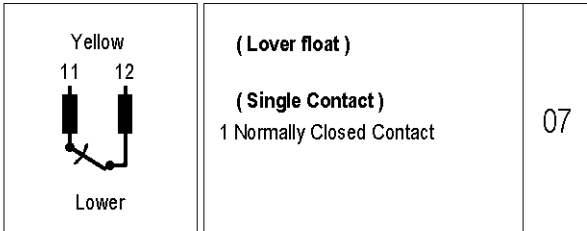
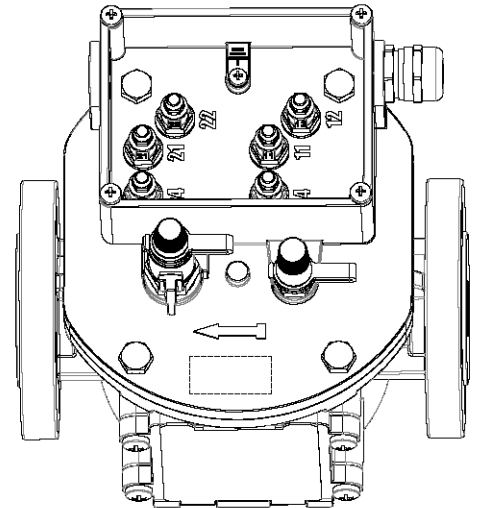
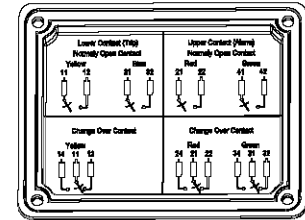


NORMALLY OPEN CONTACT

 <p>Yellow 11 12 Lower</p>	<p>(Lower float) (Single Contact) 1 Normally Open Contact</p>	<p>01</p>			
 <p>Yellow 14 11 12 Lower</p>	<p>(Lower float) (Single Contact) 1 Changeover Contact</p>	<p>02</p>			
 <p>Yellow 11 12 Lower</p>	 <p>Red 21 22 Upper</p>	<p>(2 Normally Open Contact) 1 Normally Open Contact Lower 1 Normally Open Contact Upper</p>	<p>03</p>		
 <p>Yellow 14 11 12 Lower</p>	 <p>Red 24 21 22 Upper</p>	<p>(2 Changeover Open Contact) 1 Changeover Open Contact Lower 1 Changeover Open Contact Upper</p>	<p>04</p>		
 <p>Yellow 11 12 Lower</p>	 <p>Blue 31 32 Lower</p>	 <p>Red 21 22 Upper</p>	 <p>Green 41 42 Upper</p>	<p>(4 Normally Open Contact) 2 Normally Open Contact Lower 2 Normally Open Contact Upper</p>	<p>05</p>
 <p>Yellow 11 12 Lower</p>	 <p>Blue 31 32 Lower</p>	 <p>Red 24 21 22 Upper</p>	 <p>Green 34 31 32 Upper</p>	<p>(4 Changeover Open Contact) 2 Normally Open Contact Lower 2 Changeover Open Contact Upper</p>	<p>06</p>

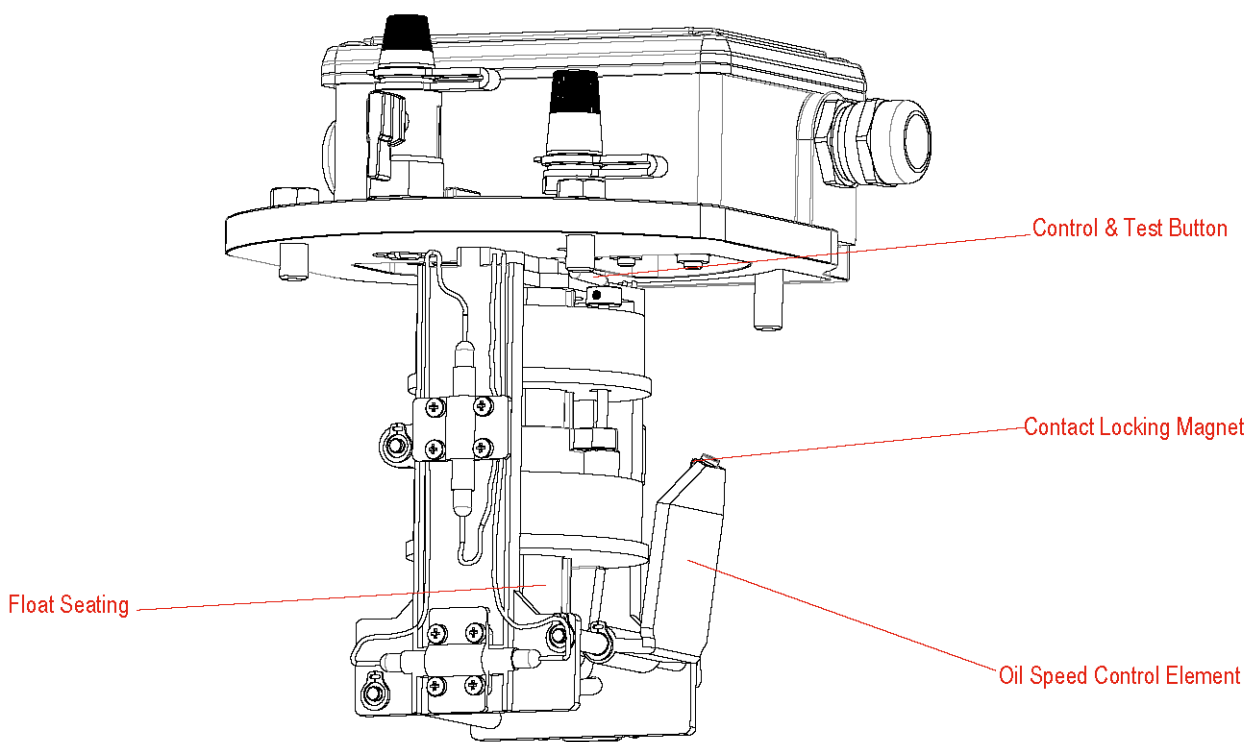
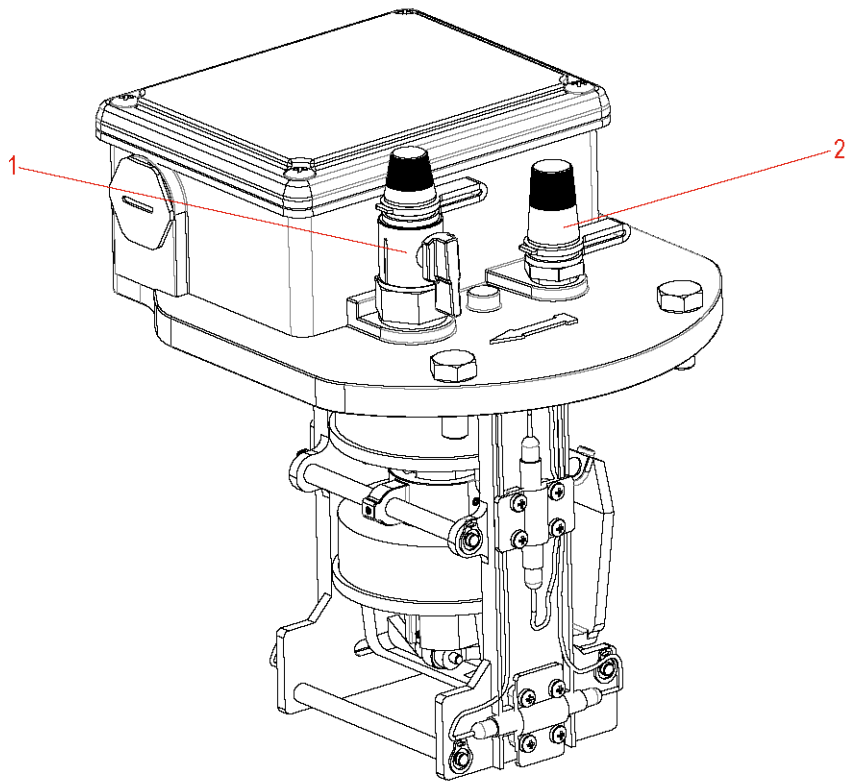


NORMALLY CLOSED CONTACT



Buchholz Relay Sectional Views

- 1 - Sample Tap
- 2 - Control & Test Button



TECHNICAL DATA

PARAMETER	DATA	NOTES
Nominal voltage	AC 230 V DC 230 V	12 V to 250 V 12 V to 250 V
Nominal current	AC 230 V DC 230 V	12 V to 250 V 12 V to 250 V
Contact voltage capacity	AC 1000 V	---
Insulation voltage capacity	AC 2000 V	Contact against casing
Temperature range:		
- ambient temperature	(-40°C to +55°C) -- (-40° F to +131°F)	Climate acc. to DIN EN 60068-2-78 : 2002-09
- working range:		
(* temperature of the insulation fluid)	(-40°C to +115°C) – (-40° F to +239° F)	Others on request
(* viscosity of the insulation fluid)	< 1100 mm ² /s	
Shock resistance	class 4M6	
- Earthquake / Vibration	2g (peak value) frequency range 2Hz to 200 Hz)	---
- Impact	25g / shock duration 11 ms	---
Resistance to pressure	0.25 MPa	---
Resistance to vacuum	< 2.5 kPa	---
Insensitivity to magnetic fields	25 mT	---
Switching system:		
- Number of switching contacts per switching system	1	More on request
- Switching contact	magnet contact tube	---
- Flow speed control element	hold by magnets	---
- Response time of speed control element	< 0.1s	---
Response of switching system in case of:		
- Gas accumulation	200 cm ³ to 300 cm ³	---
- Flow of insulation fluid		
nominal diameter (DN) 25 mm	1.00 m/s + 15%	---
nominal diameter (DN) 50 mm	1.00 m/s + 15%	---
nominal diameter (DN) 80 mm	1.00 m/s + 15% or 1.50 m/s + 15% or 2.00 m/s + 15%	---
Cable gland	M 20x1.5	Others on request
Nominal installation position	1° ascending towards expansion vessel	0° to 5°
Degree of protection	IP 54	Others on request