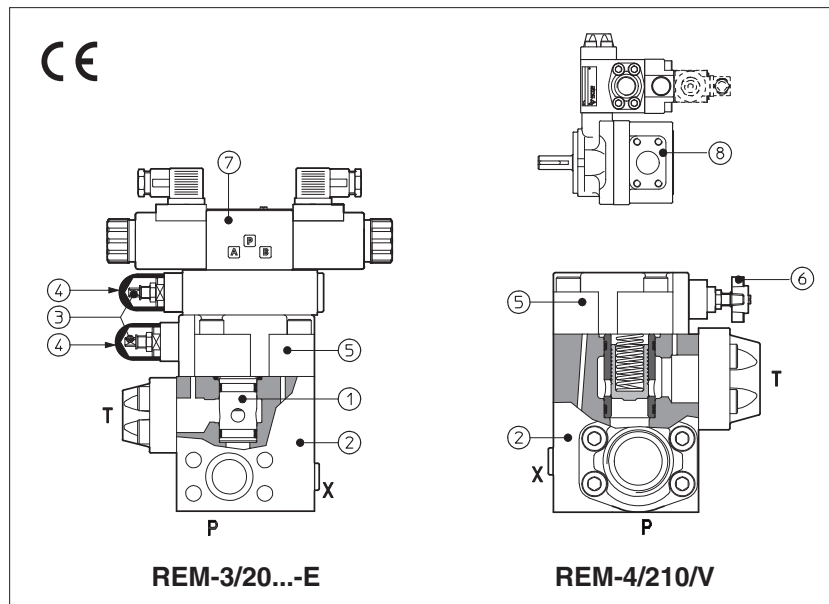


# Pressure relief valves type REM

two stage, flange mounting SAE 3/4", 1", 1 1/4"



**REM** are two stage pressure relief valves with balanced poppet and SAE flange connection, designed to operate in oil hydraulic systems.

**They can be directly mounted with SAE flange attachments on the pumps outlet ports ⑧** and, in particular, on the PFE pumps (see tab. A005, A007).

In standard versions the piloting pressure of the poppet ① of the main stage ② is regulated by means of a grub screw ③ protected by cap ④ in the cover ⑤.

Optional versions with setting adjustment by handwheel ⑥ instead of the grub screw are available on request.

Clockwise rotation increases the pressure. REM can be equipped with a venting solenoid valve ⑦ type:

- DHE for AC and DC supply, high performances, with **cURus** certified solenoids
- DHL for AC and DC supply, compact execution

Mounting surface:

SAE flange connection: **3/4", 1", 1 1/4"**

Max flow: **200, 400 and 600 l/min** respectively

Pressure up to **350 bar**

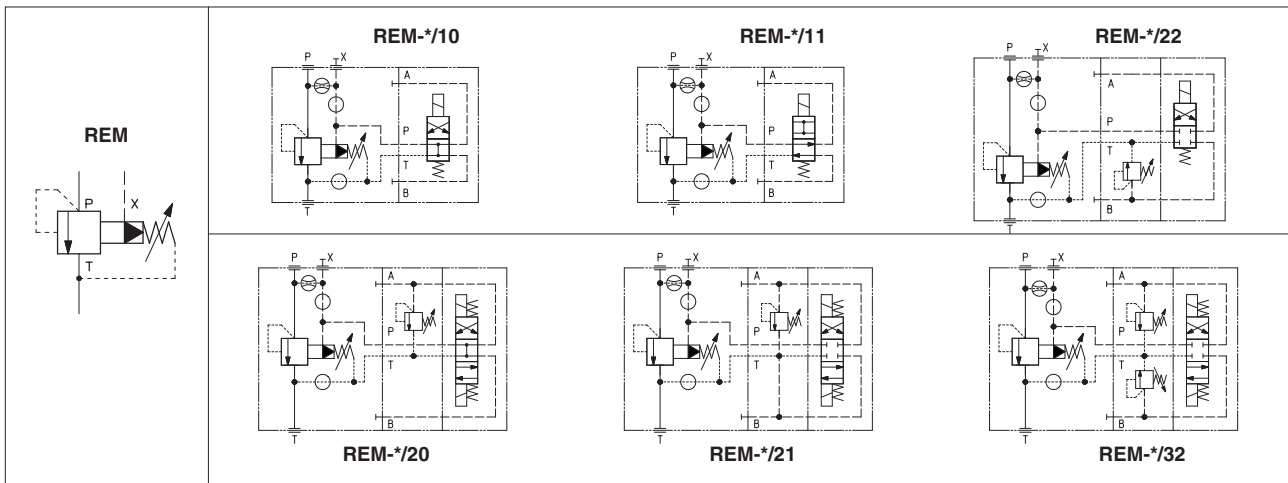
## 1 MODEL CODE

<b>REM</b>	-	<b>4</b>	/	<b>20</b>		<b>210</b>	/	<b>100/100</b>	/	<b>V</b>	-	<b>E</b>		<b>X</b>		<b>24DC</b>	** /	<b>*</b>
<b>REM</b> = pressure relief valve SAE flange mounting  Size: <b>3</b> = SAE 3/4" <b>4</b> = SAE 1" <b>5</b> = SAE 1 1/4"																		Seals material, see section 7: - = NBR <b>PE</b> = FKM <b>BT</b> = HNBR  Series number
Setting pressure and venting option (1): - = one setting pressure without option <b>10</b> = one setting pressure with venting, with de-energized solenoid <b>11</b> = one setting pressure with venting, with energized solenoid <b>20</b> = two setting pressure with venting, with de-energized solenoid <b>21</b> = two setting pressure with venting, with energized solenoid <b>22</b> = two setting pressure without venting <b>32</b> = three setting pressure without venting																		Voltage code, see section 7
Pressure range: <b>50</b> = 4÷50 bar; <b>100</b> = 6÷100 bar; <b>210</b> = 7÷210 bar; <b>350</b> = 8÷350 bar (only for REM-3)																		<b>X</b> = without connector (1): See section 10 for available connectors, to be ordered separately  <b>-00-AC</b> = AC solenoid valve without coils <b>-00-DC</b> = DC solenoid valve without coils
Pressure range of second/third setting (1): <b>50</b> = 4÷50 bar; <b>100</b> = 6÷100 bar; <b>210</b> = 7÷210 bar; <b>350</b> = 8÷350 bar (only for REM-3)																		Pilot valve (1): <b>E</b> = DHE for AC and DC supply, high performances with <b>cURus</b> certified solenoids <b>L</b> = DHL for AC and DC supply, compact execution
																		Options (2): <b>WP</b> = prolonged manual override protected by rubber cap (1) <b>V</b> = regulating by handwheel instead of a grub screw protected by cap

(1) Only for REM with solenoid valve for venting and/or for the selection of the setting pressure

(2) For handwheel features, see technical table K150

## 2 HYDRAULIC CHARACTERISTICS



## 3 GENERAL CHARACTERISTICS

Assembly position	Any position
Subplate surface finishing to ISO 4401	Acceptable roughness index, Ra ≤ 0,8 recommended Ra 0,4 - flatness ratio 0,01/100
MTTFd valves according to EN ISO 13849	75 years, see technical table P007
Ambient temperature range	<b>Standard</b> = -30°C ÷ +70°C <b>/PE option</b> = -20°C ÷ +70°C <b>/BT option</b> = -40°C ÷ +70°C
Storage temperature range	<b>Standard</b> = -30°C ÷ +80°C <b>/PE option</b> = -20°C ÷ +80°C <b>/BT option</b> = -40°C ÷ +80°C
Surface protection	Body: zinc coating with black passivation      Coil: zinc nickel coating (DC version) plastic incapsulation (AC version)
Corrosion resistance	Salt spray test (EN ISO 9227) > 200 h
Compliance	CE to Low Voltage Directive 2014/35/EU RoHS Directive 2011/65/EU as last update by 2015/65/EU REACH Regulation (EC) n°1907/2006

## 4 HYDRAULIC CHARACTERISTICS

Valve model	REM-3	REM-4	REM-5
Max flow [l/min]	200	400	600
Pressure range [bar]	4-50; 6-100; 7-210; 8-350	4÷50; 6÷100; 7÷210	
Max pressure [bar]	Ports P, X= 350 Port T= 210 without pilot solenoid valve, for version -EX and -LX, see tech tables E015 and E018		

## 5 ELECTRICAL CHARACTERISTICS (for ARAM with pilot solenoid valve)

Insulation class	<b>H</b> (180°C) for DC coils; <b>F</b> (155°C) for AC coils Due to the occurring surface temperatures of the solenoid coils, the European standards EN ISO 13732-1 and EN ISO 4413 must be taken into account
Protection degree to DIN EN 60529	<b>IP 65</b> (with connectors correctly assembled)
Relative duty factor	100%
Supply voltage and frequency	See section 7
Supply voltage tolerance	± 10%
Certification	<b>cURus</b> North American standard - only for DHE pilot valve

## 6 SEALS AND HYDRAULIC FLUID - for other fluids not included in below table, consult our technical office

Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +80°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	15÷100 mm <sup>2</sup> /s - max allowed range 2,8 ÷ 500 mm <sup>2</sup> /s		
Max fluid contamination level	ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog		
<b>Hydraulic fluid</b>	<b>Suitable seals type</b>	<b>Classification</b>	<b>Ref. Standard</b>
Mineral oils	NBR, FKM, HNBR	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR, HNBR	HFC	

**7 COIL VOLTAGE**

External supply nominal voltage ± 10%	Voltage code	Type of connector	-EX Power consumption (2)	-LX Power consumption (2)	Code of spare coil -EX	Code of spare coil -LX
12 DC	<b>12 DC</b>	666 or 667	30W	29W	COE-12DC	COL-12DC
14 DC	<b>14 DC</b>				COE-14DC	COL-14DC
110 DC	<b>110 DC</b>				COE-110DC	COL-110DC
220 DC	<b>220 DC</b>				COE-220DC	COL-220DC
110/50 AC (1)	<b>110/50/60 AC</b>	666 or 667	58VA (3)	58VA (3)	COE-110/50/60AC	COL-110/50/60AC
115/60 AC	<b>115/60 AC</b>		80VA (3)		COE-115/60AC	COL-115/60AC
230/50 AC (1)	<b>230/50/60 AC</b>		58VA (3)		COE-230/50/60AC	COL-230/50/60AC
230/60 AC	<b>230/60 AC</b>		80VA (3)		COE-230/60AC	COL-230/60AC

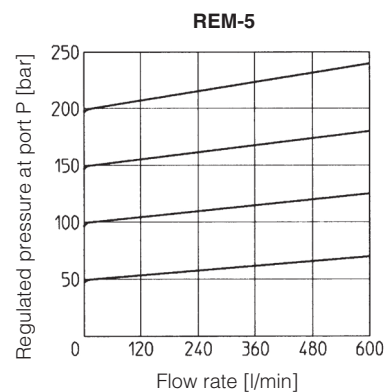
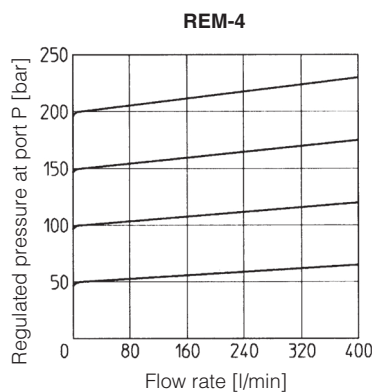
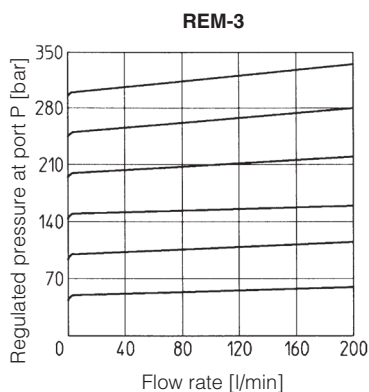
(1) For other supply voltages available on request see technical tables E015, E018.

(2) Coil can be supplied also with 60 Hz of voltage frequency: in this case the performances are reduced by 10 ÷ 15% and the power consumption is 55 VA (DHL) and 58 VA (DHE)

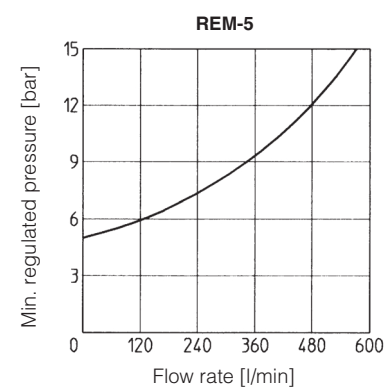
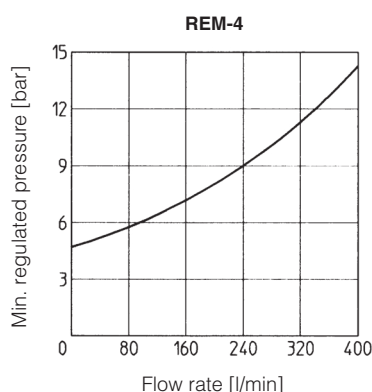
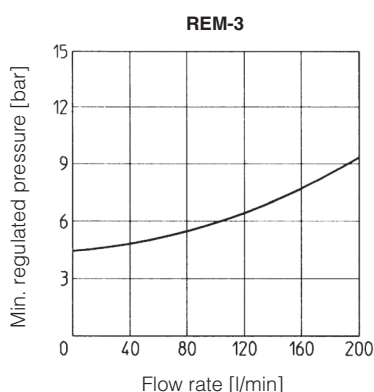
(3) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.

(4) When solenoid is energized, the inrush current is approx 3 times the holding current.

**8 REGULATED PRESSURE VERSUS FLOW DIAGRAMS** based on fluid viscosity of 25 mm<sup>2</sup>/s at 40°



**9 MINIMUM PRESSURE VERSUS FLOW DIAGRAMS** based on fluid viscosity of 25 mm<sup>2</sup>/s at 40° C



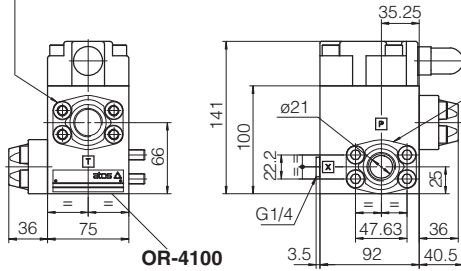
**10 ELECTRIC CONNECTORS ACCORDING TO DIN 43650** for REM with solenoid valve (to be ordered separately, see tech table K800)

**666** = standard connector IP-65, suitable for direct connection to electric supply source

**667** = as 666, but with built-in signal led. Available for power supply voltage 24 AC or DC, 110 AC or DC, 220 AC or DC

**REM-3-\*-EX**

Flange type WFD-20

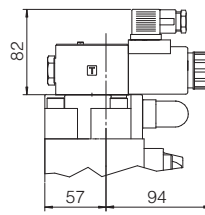


OR-4100

Mass: 6,6 Kg

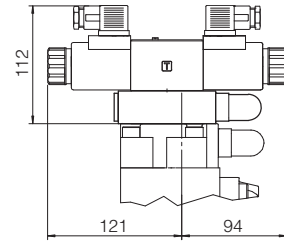
Flange type WFD-20

REM-3/10/\*\*-EX  
REM-3/11/\*\*-EX



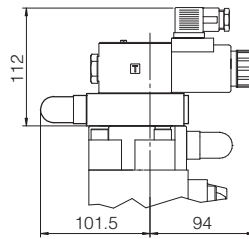
Mass: 8,1 Kg

REM-3/20/\*\*-EX  
REM-3/21/\*\*-EX



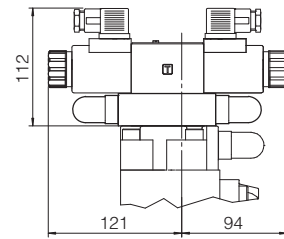
Mass: 9,2 Kg

REM-3/22/\*\*-EX



Mass: 8,9 Kg

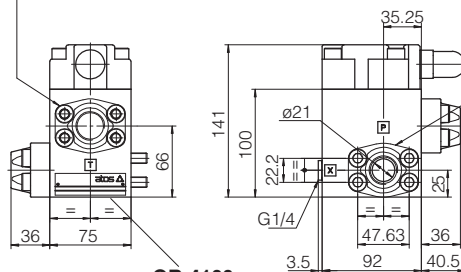
REM-3/32/\*\*-EX



Mass: 9,3 Kg

**REM-3-\*-LX**

Flange type WFD-20

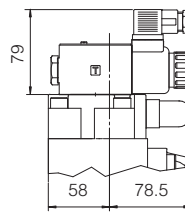


OR-4100

Mass: 6,6 Kg

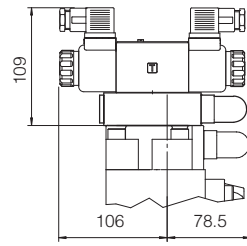
Flange type WFD-20

REM-3/10/\*\*-LX  
REM-3/11/\*\*-LX



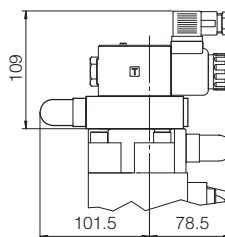
Mass: 7,9 Kg

REM-3/20/\*\*-LX  
REM-3/21/\*\*-LX



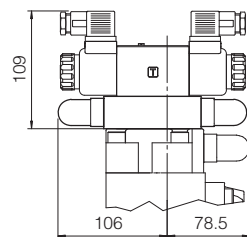
Mass: 8,8 Kg

REM-3/22/\*\*-LX



Mass: 8,7 Kg

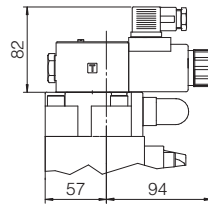
REM-3/32/\*\*-LX



Mass: 8,9 Kg

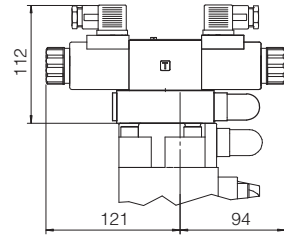
**REM-4\*-EX**

**REM-4/10\*\*-EX  
REM-4/11\*\*-EX**



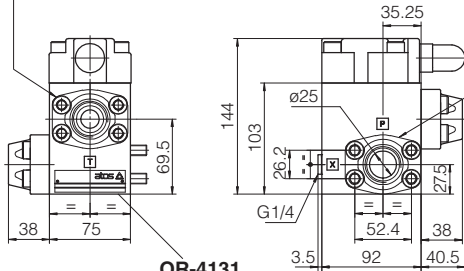
Mass: 8,3 Kg

**REM-4/20\*\*-EX  
REM-4/21\*\*-EX**



Mass: 9,4 Kg

**Flange type WFD-25**

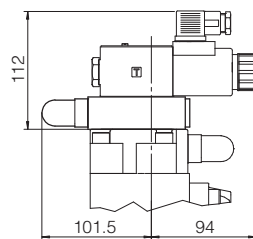


**OR-4131**

Mass: 6,8 Kg

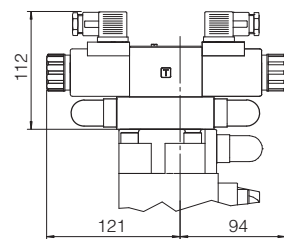
**Flange type WFD-25**

**REM-4/22\*\*-EX**



Mass: 9,1 Kg

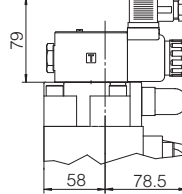
**REM-4/32\*\*-EX**



Mass: 9,5 Kg

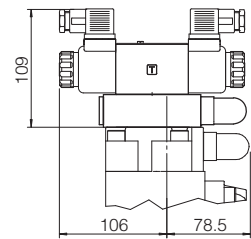
**REM-4\*-LX**

**REM-4/10\*\*-LX  
REM-4/11\*\*-LX**



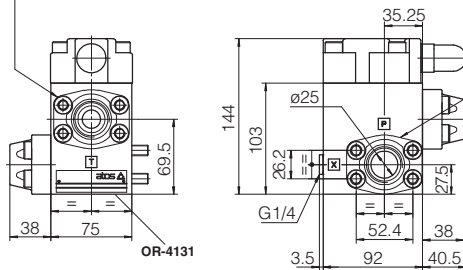
Mass: 8,1 Kg

**REM-4/20\*\*-LX  
REM-4/21\*\*-LX**



Mass: 9 Kg

**Flange type WFD-25**

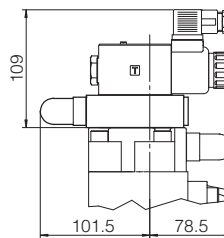


**OR-4131**

Mass: 6,8 Kg

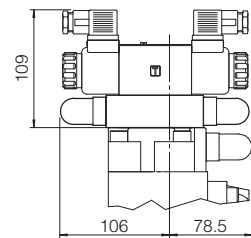
**Flange type WFD-25**

**REM-4/22\*\*-LX**



Mass: 8,9 Kg

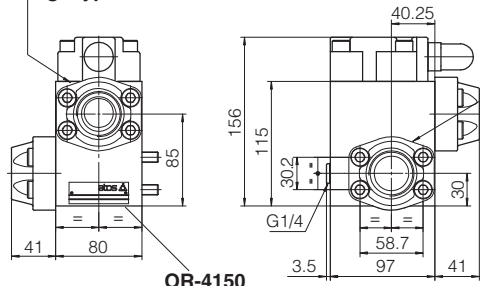
**REM-4/32\*\*-LX**



Mass: 9,1 Kg

**REM-5-\*-EX**

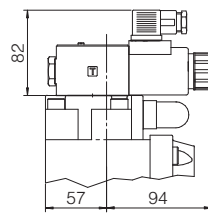
Flange type WFD-32



**OR-4150**

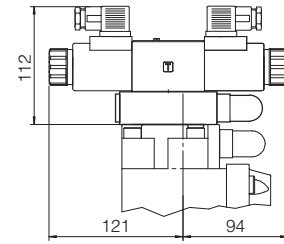
Mass: 8,2 Kg

**REM-5/10/\*\*-EX  
REM-5/11/\*\*-EX**



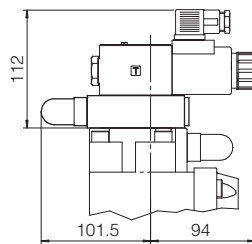
Mass: 9,7 Kg

**REM-5/20/\*\*-EX  
REM-5/21/\*\*-EX**



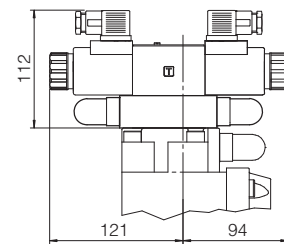
Mass: 10,8 Kg

**REM-5/22/\*\*-EX**



Mass: 10,5 Kg

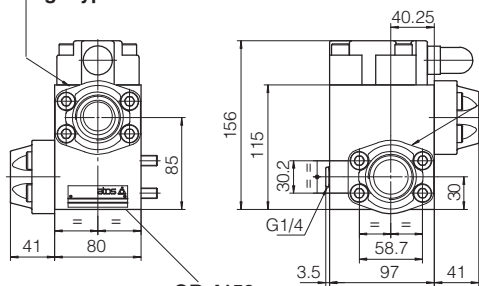
**REM-5/32/\*\*-EX**



Mass: 10,9 Kg

**REM-5-\*-LX**

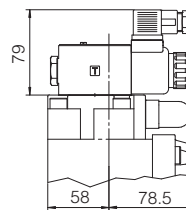
Flange type WFD-32



**OR-4150**

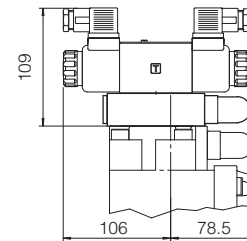
Mass: 8,2 Kg

**REM-5/10/\*\*-LX  
REM-5/11/\*\*-LX**



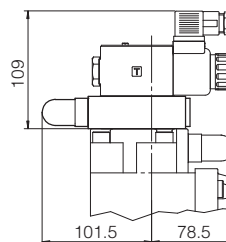
Mass: 9,5 Kg

**REM-5/20/\*\*-LX  
REM-5/21/\*\*-LX**



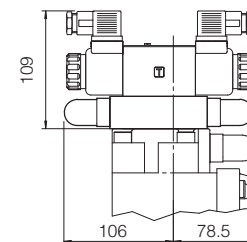
Mass: 10,4 Kg

**REM-5/22/\*\*-LX**



Mass: 10 Kg

**REM-5/32/\*\*-LX**

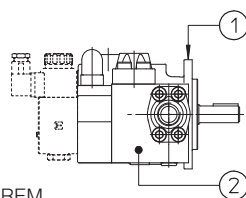


Mass: 10,5 Kg

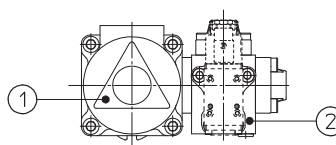
Overall dimensions refer to valves **DC** voltage, with connectors type 666

**12 ASSEMBLY EXAMPLE OF A REM VALVE ON A PFE PUMP**

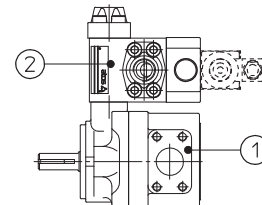
**LATERAL VIEW OF PUMP**



**REAR VIEW OF PUMP**



**TOP VIEW OF PUMP**



- ① Pump type PFE
- ② Relief valve type REM