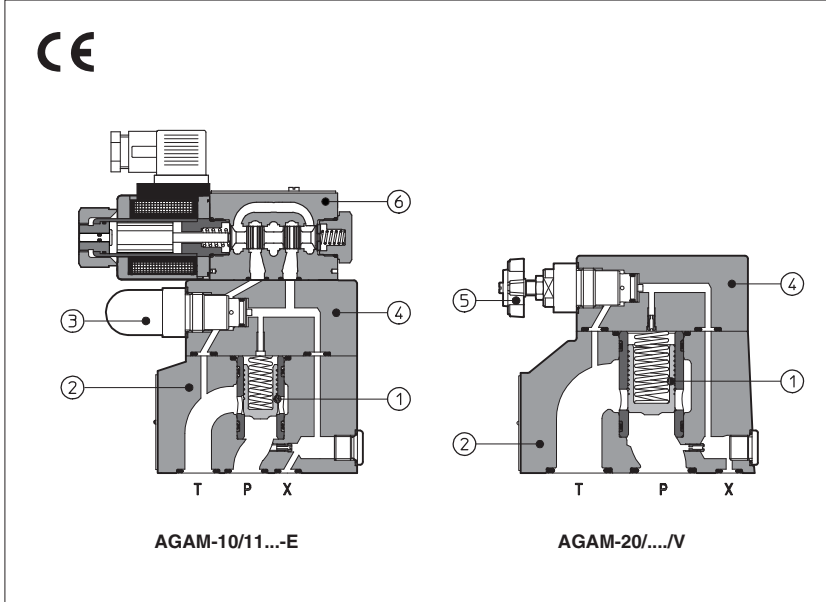


# Pressure relief valves type AGAM

two stage, subplate mounting - ISO 6264 size 10, 20 and 32



AGAM are double stage pressure relief valves with balanced poppet, designed to operate in oil hydraulic systems.

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

Optional versions with setting adjustment by handwheel (5) instead of the grub screw are available on request.

Clockwise rotation increases the pressure.

Also available in safety option with sealed regulation:

**/PED** conforming to PED Directive (97/23/CE). The valves are factory set at the pressure level required by the customer with a flow through the valve as shown in section 6.

For this version the P, Q limits are shown in section 10.

AGAM can be equipped with a solenoid valve (6) (for venting or for different pressure setting) type:

- DHI for AC and DC supply, with **cURus** certified solenoids
- DHE for AC and DC supply, high performances
- DHER, as DHE but with **cURus** certified solenoids

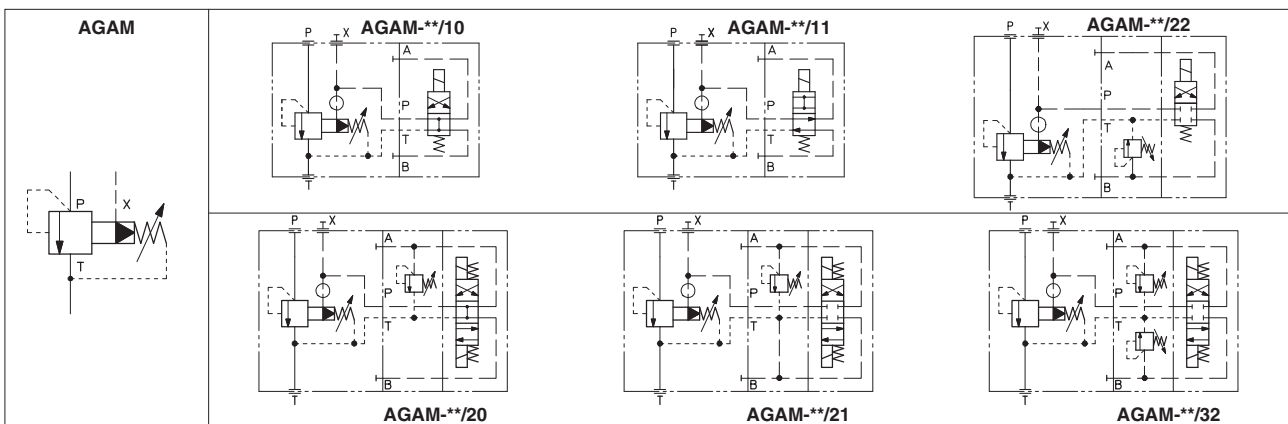
Mounting surface: ISO 6264 size 10, 20 and 32. Max flow: 200, 400 and 600 l/min respectively. Pressure up to 350 bar.

1	MODEL CODE	AGAM	- 20	/ 20	/210	/100/100	/V	/*	-I	X	24DC	**	/*
					(1)	(1)			(1)	(1)	(1)		
		AGAM = pressure relief valve subplate mounting											
		Size: <b>10 20 32</b>											
		Setting pressure and venting option: - = 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											
		Setting: see section 3 for available setting											
		Pressure range of second/third setting (2): <b>50</b> = 4÷50 bar; <b>100</b> = 6÷100 bar; <b>210</b> = 7÷210 bar; <b>350</b> = 8÷350 bar											
												Synthetic fluids: <b>WG</b> = water-glycol <b>PE</b> = phosphate ester	
												Series number	
												Voltage code, see section 8: <b>00</b> = solenoid valve without coils (only for OI solenoid)	
												<b>X</b> = without connector See section 7 for available connectors, to be ordered separately	
													Pilot valve: <b>-I</b> = DHI for AC and DC supply, with <b>cURus</b> certified solenoids <b>-E</b> = DHE for AC and DC supply, high performances <b>-ER</b> = DHER as DHE but with <b>cURus</b> certified solenoids
													Only for /PED options: <b>190</b> = factory pressure setting to be defined depending to the customer requirement (example 190 = 190 bar)
													Options, see section 5 <b>/E /PED /V /WP /Y</b>

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

(2) For valves with multiple pressure settings, the eventual /PED option is relevant only to the first main setting. The second (and third) pressure setting are not sealed and their regulation must be lower than the /PED one.

## 2 HYDRAULIC SYMBOLS



### 3 HYDRAULIC CHARACTERISTICS

Valve model		AGAM-10	AGAM-20	AGAM-32	
Setting	standard	50; 100; 210; 350			
	/PED				
Pressure range	standard	4÷50;	6÷100;	7÷210;	8÷350
	/PED	10÷50;	10÷100;	10÷210;	10÷350
Max flow	standard	200	400	600	
	/PED				

### 4 MAIN CHARACTERISTICS OF PRESSURE CONTROL VALVES TYPE AGAM

Assembly position / location	Any position
Subplate surface finishing	Roughness index $\sqrt{0.4}$ , flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20°C to + 70°C
Fluid	Hydraulic oil as per DIN 51524 . . . 535; for other fluids see section 11
Recommended viscosity	15 ÷ 100 mm <sup>2</sup> /s at 40°C (ISO VG 15 ÷100)
Fluid contamination class	ISO 19/16, achieved with in line filters at 25 µm value and $\beta_{0.5} \geq 75$ (recommended)
Fluid temperature	-20°C +60°C (standard and /WG seals) -20°C +80°C (/PE seals)

#### 4.1 Coils characteristics

Insulation class	H
Connector protection degree	IP 65
Relative duty factor	100%
Supply voltage and frequency	See electric feature 8
Supply voltage tolerance	± 10%
Certification (only for -I and -ER version)	cURus North American standard

### 5 OPTIONS

/E = external pilot

/PED = conforming to Directive 97/23/CE (not available with option /V)

/V = regulating handwheel instead of grub screw protected by cap (for handwheel features, see table K150), (not available with option /PED)

/WP = prolonged manual override protected by rubber cap (only for AGAM with pilot solenoid valve)

/Y = external drain (only for AGAM with pilot solenoid valve)

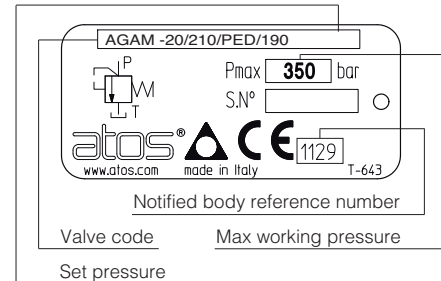
### 6 SETTING OF VALVES WITH /PED OPTION

The /PED valves are factory set at the pressure level required by the customer (every 1 bar) at the following flow shown in the table.

The set pressure is marked on the valve nameplate, see section 6.1

VALVE MODEL	FLOW FOR FACTORY PRESSURE SETTING (l/min)
AGAM-10	25
AGAM-20	25
AGAM-32	25

#### 6.1 EXAMPLE OF NAMEPLATE FOR /PED OPTION



### 7 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 FOR AGAM WITH SOLENOID VALVE

The connectors must be ordered separately

Code of connector	Function
SP-666	Connector IP-65, suitable for direct connection to electric supply source
SP-667	As SP-666 connector IP-65 but with built-in signal led, suitable for direct connection to electric supply source

For other available connectors, see tab. E010 and K500.

### 8 ELECTRIC FEATURES FOR AGAM WITH SOLENOID VALVE

Solenoid valve type	External supply nominal voltage ± 10% (1)		Voltage code	Type of connector	Power consumption (3)	Code of spare coil DHI	Colour of coil label DHI	Code of spare coil DHE	Code of spare coil DHER
DHI DHE DHER	DC	12 DC	<b>12 DC</b>	SP-666 or SP-667	33 W (DHI) 30 W (DHE, DHER)	SP-COU-12DC /80 SP-COU-24DC /80 SP-COU-110DC /80 SP-COU-220DC /80	green red black black	SP-COE-12DC/10 SP-COE-24DC/10 SP-COE-110DC/10 SP-COE-220DC/10	SP-COER-12DC/10 SP-COER-24DC/10 SP-COER-110DC/10 SP-COER-220DC/10
		24 DC	<b>24 DC</b>						
DHI DHE DHER	AC	110 DC	<b>110 DC</b>	SP-666 or SP-667	60 VA (DHI) 58 VA (DHE, DHER) (4)	SP-COI-110/50/60AC /80 SP-COI-120/60AC /80 SP-COI-230/50/60AC /80 SP-COI-230/60AC /80	yellow - white light blue silver	SP-COE-110/50/60AC/10 SP-COE-115/60AC/10 - SP-COE-230/50/60AC/10 SP-COE-230/60AC/10	SP-COER-110/50/60AC/10 SP-COER-115/60AC/10 - SP-COER-230/50/60AC/10 SP-COER-230/60AC/10
		220 DC	<b>220 DC</b>						
		110/50 AC (2)	<b>110/50/60 AC</b>						
		115/60 AC (5)	<b>115/60 AC</b>						
		120/60 AC	<b>120/60 AC</b>						
		230/50 AC (2)	<b>230/50/60 AC</b>						
		230/60 AC	<b>230/60 AC</b>						

(1) For other supply voltages available on request see technical tables E010, E015.

(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 (DHI) and 58 VA (DHER)

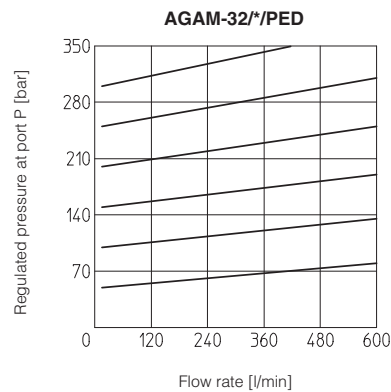
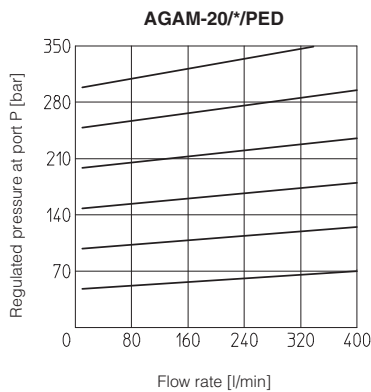
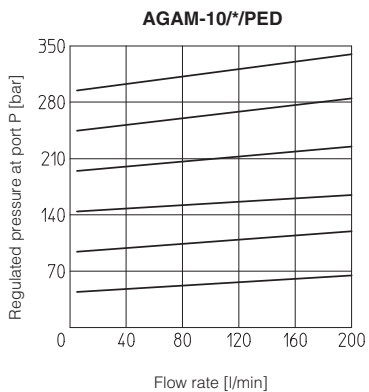
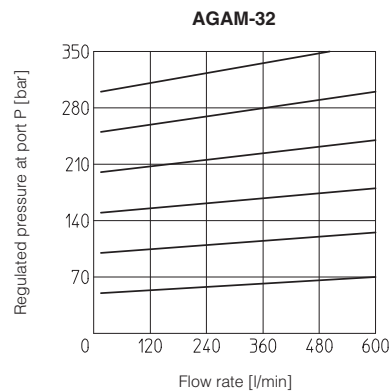
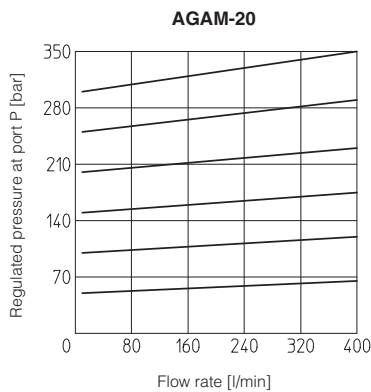
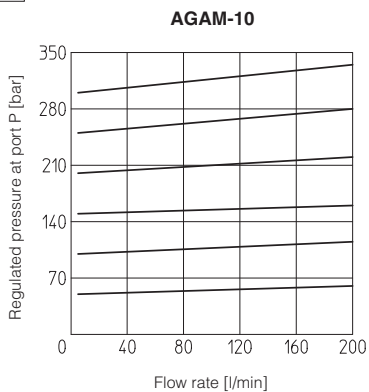
(3) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.

(4) When solenoid is energized, the inrush current is approx 3 times the holding current. Inrush current values correspond to a power consumption of about 150 VA.

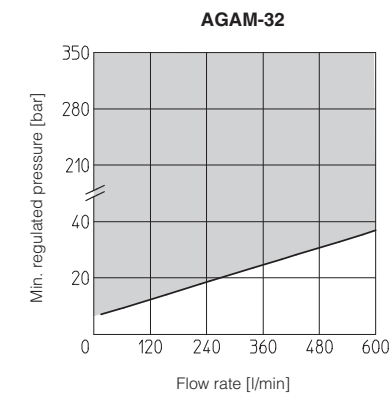
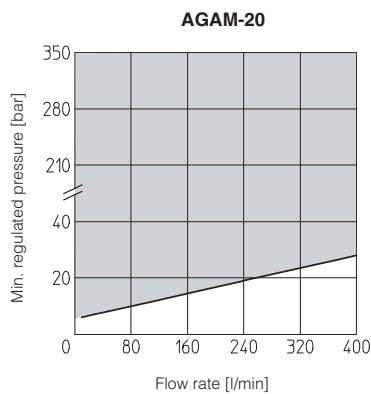
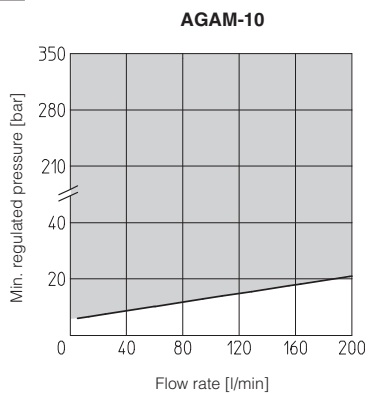
(5) Only for DHE and DHER

(6) Only for DHI

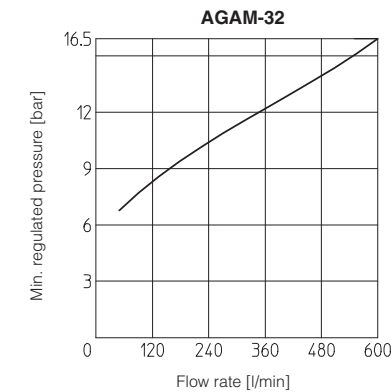
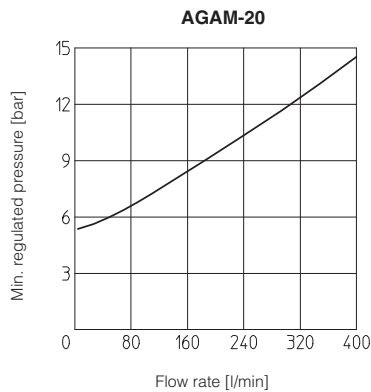
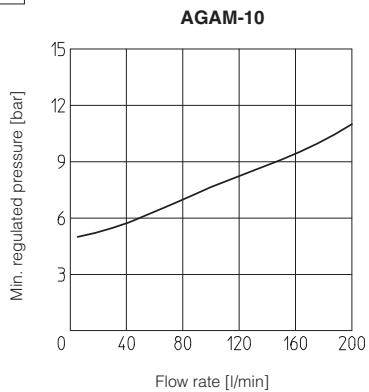
**9 REGULATED PRESSURE VERSUS FLOW DIAGRAMS** based on mineral oil ISO VG 46 at 50°C



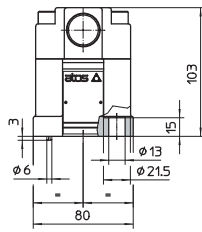
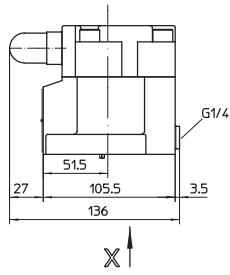
**10 PERMISSIBLE RANGE (shared area)** based on mineral oil ISO VG 46 at 50°C



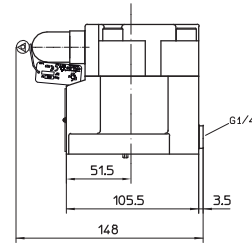
**11 MINIMUM PRESSURE VERSUS FLOW DIAGRAMS** based on mineral oil ISO VG 46 at 50°C



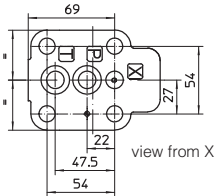
# AGAM-10



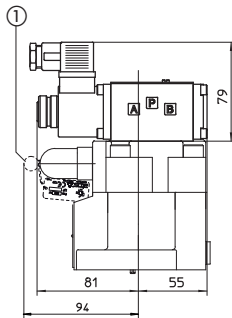
Mass: 3,6 Kg



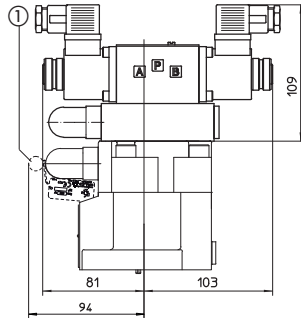
OPTION /PED



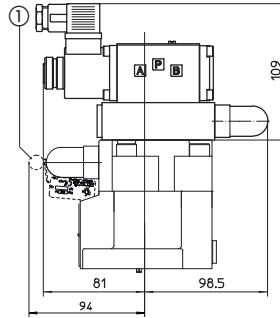
**ISO 6264: 2007**  
**Mounting surface: 6264-06-09-1-97**  
 Fastening bolts:  
 4 socket head screws M12x35 class 12.9  
 Tightening torque = 125 Nm  
 Seals: 2 OR 123; 1 OR 109/70  
 Ports P, T:  $\varnothing = 14,5$  mm  
 Ports X:  $\varnothing = 3,2$  mm



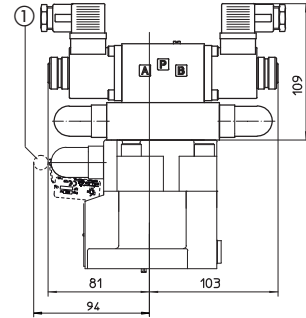
**AGAM-10/10/\*\*-IX**  
**AGAM-10/11/\*\*-IX**  
 Mass: 5,1 Kg



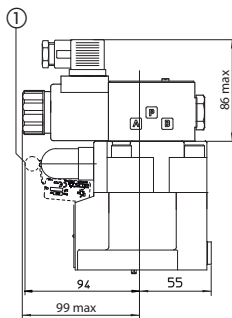
**AGAM-10/20/\*\*-IX**  
**AGAM-10/21/\*\*-IX**  
 Mass: 6,2 Kg



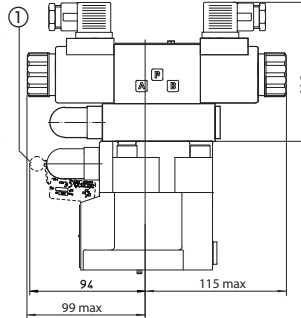
**AGAM-10/22/\*\*-IX**  
 Mass: 5,9 Kg



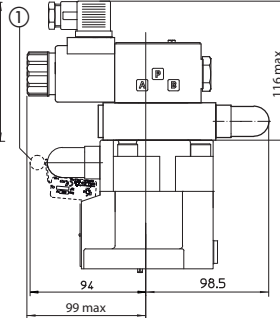
**AGAM-10/32/\*\*-IX**  
 Mass: 6,3 Kg



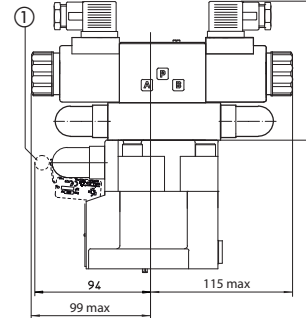
**AGAM-10/10/\*\*-E(R)X**  
**AGAM-10/11/\*\*-E(R)X**  
 Mass: 5,1 Kg



**AGAM-10/20/\*\*-E(R)X**  
**AGAM-10/21/\*\*-E(R)X**  
 Mass: 6,2 Kg



**AGAM-10/22/\*\*-E(R)X**  
 Mass: 5,9 Kg

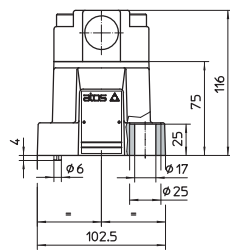
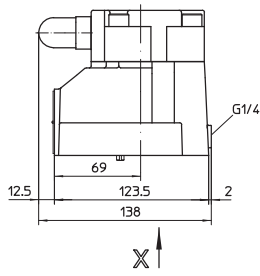


**AGAM-10/32/\*\*-E(R)X**  
 Mass: 6,3 Kg

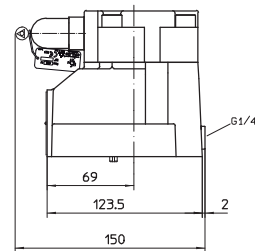
① = sealed adjustment and nameplate only for /PED option

Overall dimensions refer to valves with connectors type SP-666

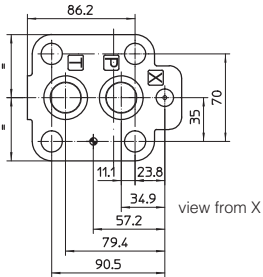
# AGAM-20



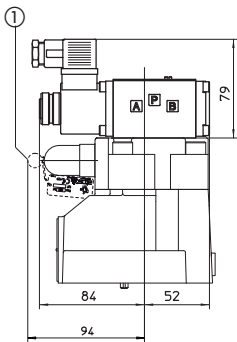
Mass: 4,8Kg



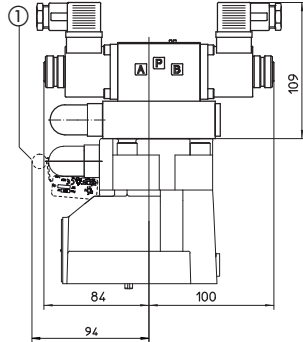
OPTION /PED



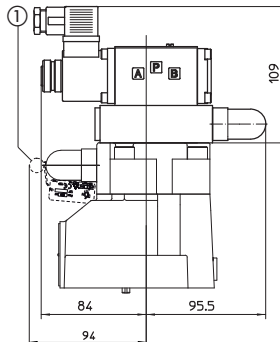
**ISO 6264: 2007**  
**Mounting surface: 6264-08-11-1-97**  
 Fastening bolts:  
 4 socket head screws M16x50 class 12.9  
 Tightening torque = 300 Nm  
 Seals: 2 OR 4112; 1 OR 109/70  
 Ports P, T:  $\varnothing = 24$  mm  
 Ports X:  $\varnothing = 3,2$  mm



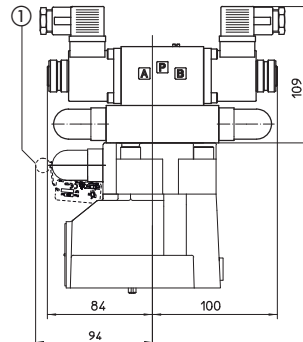
**AGAM-20/10\*\*-IX**  
**AGAM-20/11\*\*-IX**  
 Mass: 6,3 Kg



**AGAM-20/20\*\*-IX**  
**AGAM-20/21\*\*-IX**  
 Mass: 7,4Kg

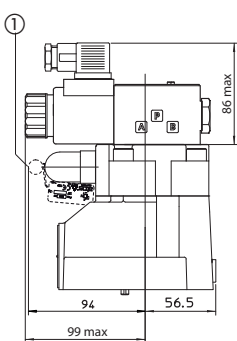


**AGAM-20/22\*\*-IX**  
 Mass: 7,1 Kg

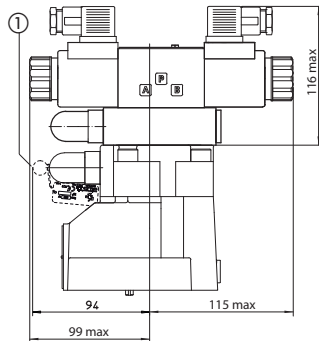


**AGAM-20/32\*\*-IX**  
 Mass: 7,5 Kg

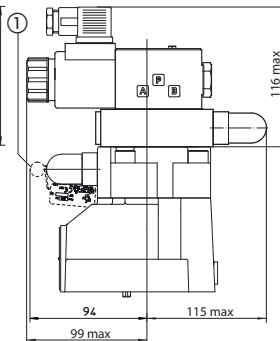
① = sealed adjustment and nameplate only for /PED option



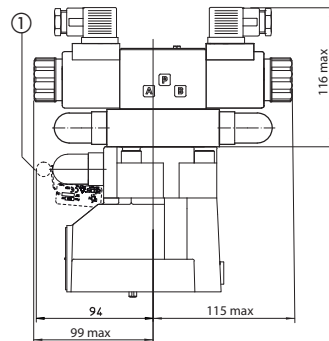
**AGAM-20/10\*\*-E(R)X**  
**AGAM-20/11\*\*-E(R)X**  
 Mass: 6,3 Kg



**AGAM-20/20\*\*-E(R)X**  
**AGAM-20/21\*\*-E(R)X**  
 Mass: 7,4Kg



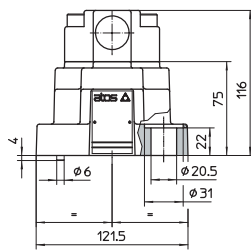
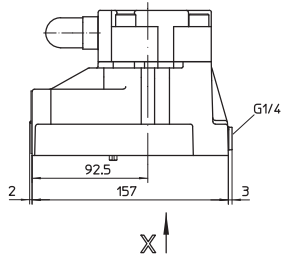
**AGAM-20/22\*\*-E(R)X**  
 Mass: 7,1 Kg



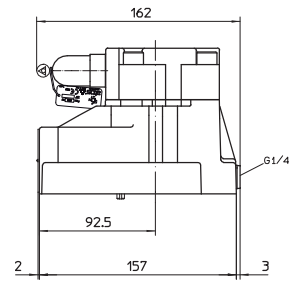
**AGAM-20/32\*\*-E(R)X**  
 Mass: 7,5 Kg

① = sealed adjustment and nameplate only for /PED option

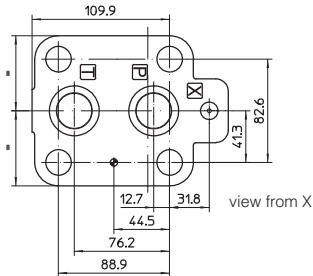
# AGAM-32



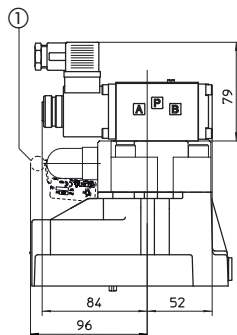
Mass: 6,2 Kg



OPTION /PED

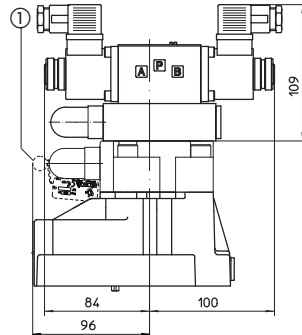


**ISO 6264: 2007**  
**Mounting surface: 6264-10-17-1-97**  
 (with M20 fixing holes instead of standard M18)  
 Fastening bolts:  
 4 socket head screws M20x60 class 12.9  
 Tightening torque = 600 Nm  
 Seals: 2 OR 4131; 1 OR 109/70  
 Ports P, T: Ø = 28,5 mm  
 Ports X: Ø = 3,2 mm



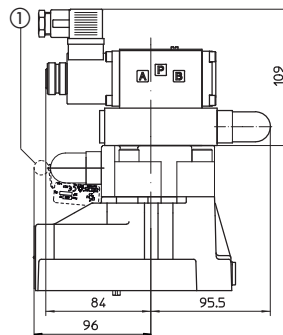
**AGAM-32/10/\*\*-IX**  
**AGAM-32/11/\*\*-IX**

Mass: 7,7 Kg



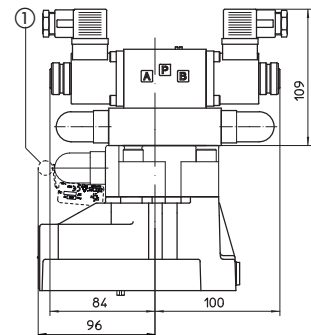
**AGAM-32/20/\*\*-IX**  
**AGAM-32/21/\*\*-IX**

Mass: 8,8 Kg



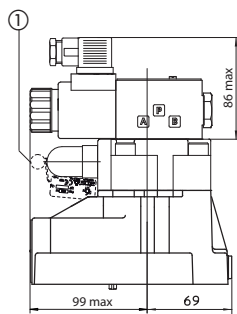
**AGAM-32/22/\*\*-IX**

Mass: 8,5 Kg



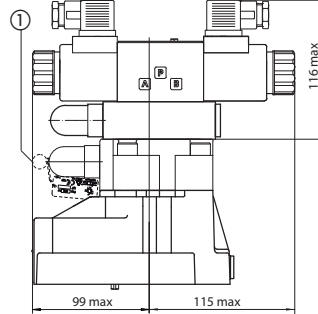
**AGAM-32/32/\*\*-IX**

Mass: 8,9 Kg



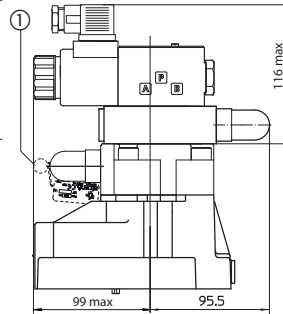
**AGAM-32/10/\*\*-E(R)X**  
**AGAM-32/11/\*\*-E(R)X**

Mass: 7,7 Kg



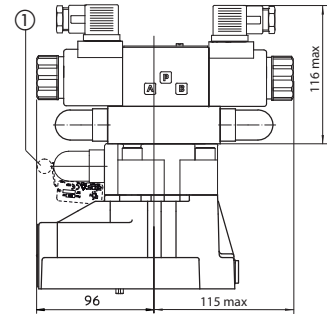
**AGAM-32/20/\*\*-E(R)X**  
**AGAM-32/21/\*\*-E(R)X**

Mass: 8,8 Kg



**AGAM-32/22/\*\*-E(R)X**

Mass: 8,5 Kg



**AGAM-32/32/\*\*-E(R)X**

Mass: 8,9 Kg

① = sealed adjustment and nameplate only for /PED option

Overall dimensions refer to valves with connectors type SP-666

## 13 MOUNTING SUBPLATES

Valve	Subplate model	Port location	Ports			Ø Counterbore [mm]			Mass [Kg]
			P	T	X	P	T	X	
AGAM-10	BA-306	Ports P, T, X underneath;	G 1/2"	G 3/4"	G 1/4"	30	36,5	21,5	1,5
AGAM-20	BA-406		G 3/4"	G 3/4"	G 1/4"	36,5	36,5	21,5	3,5
	BA-506		G 1"	G 1"	G 1/4"	46	46	21,5	3,5
AGAM-32	BA-706		G 1 1/2"	G 1 1/2"	G 1/4"	63,5	63,5	21,5	6

The subplates are supplied with fastening bolts. For further details see table K280