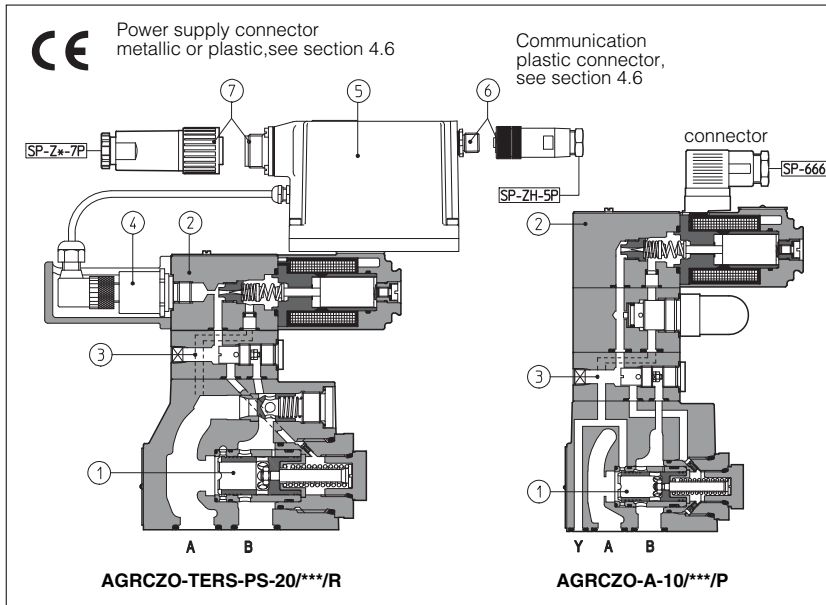


Proportional reducing valves type AGRCZO

two stages, normally closed, ISO 5781 size 10 and 20



AGRCZO are two-stage normally closed proportional pressure reducing valves with pressure regulation proportional to electronic reference signal.

They operate in association with electronic drivers, see table 8 which supply the proportional valve with proper current signal to align valve regulation to the reference signal supplied to the electronic driver.

They are available in different executions:

- -A, without integral pressure transducer.
- -AE, -AES, as -A plus analogue (AE) or digital (AES) integral electronics (5).
- -TERS with integral pressure transducer (4) plus digital electronics (5) preset in closed loop, featuring improved static and dynamic performances.
- -AERS as -TERS but without integral pressure transducer (predisposed for connection of remote pressure transducer).

The piloting pressure to the poppet (1) is modulated by a proportional pressure relief valve type RZMO (2), see tab. F007.

A modular pressure compensated flow control cartridge (3) assures constant pilot flow and therefore high pressure stability.

Following communication interfaces (4) are available for the digital -AES, -TERS and

-AERS executions:

- -PS, RS232 serial communication interface. The valve reference signal is provided with analogue commands via the 7 (or 12) pins connector (7):
 - -BC, CANbus interface
 - -BP, PROFIBUS-DP interface
- In the -BC and -BP interfaces the valve reference signal is provided via fieldbus; during start up or maintenance, the valves can be operated with analogue signals via the 7 (or 12) pins connector (7).

The coils are fully plastic encapsulated (insulation class H), and the valves have antivibration, antishock and weather-proof features.

Surface mounting: ISO 5781 size 10 and 20.
Max flow: 160, 300 l/min respectively
Max pressure: 315 bar.

1 MODEL CODE

AGRCZO - TERS - PS - 10 / 315 / * ** / *

Proportional pressure reducing valve

A = without integral transducer
AE = as A plus integral electronics
AES = as A plus integral digital electronics
TERS = with integral digital electronics and pressure transducer
AERS = as TERS but with remote pressure transducer (to be ordered separately, see tab. G460)

Communication interfaces (only for AES, TERS and AERS)

PS = RS232 serial
BC = CANbus
BP = PROFIBUS-DP

Size: **10, 20**

Pressure range:

50 = 50 bar (not for -TERS, -AERS) **210** = 210 bar
100 = 100 bar **315** = 315 bar

Synthetic fluids
WG = water-glycol
PE = phosphate ester

Series number

Options:

P = with integral mechanical pressure limiter;

R = with check valve;

for -A execution:

6 = with 6 V_{DC} coil instead of standard 12V_{DC} coil
18 = with 18 V_{DC} coil instead of standard 12V_{DC} coil

for -AE execution:

I = current reference 4±20 mA)

Q = enable signal

for -AES, -TERS and -AERS executions:

I = current reference 4±20 mA (only for TERS execution)

Z = double power supply, enable and fault (12 pin connector)

C = remote pressure transducer with current feedback 4±20 mA (only for AERS execution)

2 HYDRAULIC CHARACTERISTICS (based on mineral oil ISO VG 46 at 50 °C)

Hydraulic symbols	AGRCZO-A, AGRCZO-A-*/R		AGRCZO-AE, -AES, AGRCZO-AE-*/R, -AES/R		AGRCZO-TERS, AERS, AGRCZO-TERS-*/R, -AERS-*/R	
	10	20	10	20	10	20
Size	10	20	10	20	10	20
Max regulated pressure (Q = 10 l/min) [bar]	50; 100; 210; 315				100; 210; 315	
Min regulated pressure at port A [bar]	1					
Max pressure at port B [bar]	315					
Max pressure at port A [bar]	315					
Max flow [l/min]	160	300	160	300	160	300
Response time 0 - 100% step signal (depending on installation) - see section 6.4 [ms]	50	60	50	60	45	50
Hysteresis [% of the max pressure]	≤ 2				≤ 0,5	
Linearity [% of the max pressure]	≤ 3				≤ 1,0	
Repeatability [% of the max pressure]	≤ 2				≤ 0,2	
Thermal drift (-TERS execution)	zero point displacement < 1% at ΔT = 40°C					

Above performance data refer to valves coupled with Atos electronic drivers, see section 8.

3 MAIN CHARACTERISTICS OF PROPORTIONAL PRESSURE REDUCING VALVES TYPE AGRCZO

Assembly position	Any position
Subplate surface finishing	Roughness index, \sqrt{Ra} flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20°C ÷ +70°C for -A execution; -20°C ÷ +60°C for -AE and -AES; -20°C ÷ +50°C for -TERS and -AERS
Fluid	Hydraulic oil as per DIN 51524 ... 535 for other fluids see section 7
Recommended viscosity	15 ÷ 100 mm ² /s at 40°C (ISO VG 15÷100)
Fluid contamination class	ISO 18/15 achieved with in line filters of 10 µm and $\beta_{10} \geq 75$ (recommended)
Fluid temperature	-20°C +60°C (standard and /WG seals) -20°C +80°C (/PE seals)

3.1 Electrical characteristics

Coil resistance R at 20°C	3 ÷ 3,3 Ω for standard 12 V _{DC} coil; 2 ÷ 2,2 Ω for 6 V _{DC} coil; 13 ÷ 13,4 Ω for 18 V _{DC} coil
Max solenoid current	2,6 A for standard 12 V _{DC} coil; 3,25 A for 6 V _{DC} coil; 1,5 A for 18 V _{DC} coil
Max power	40 Watt
Protection degree (CEI EN-60529)	IP65 for -A execution; IP65÷67 for -AE, -TERS and AERS executions, depending to the connector type (see sect. 4.6)
Duty factor	Continuous rating (ED=100%)

4 INTEGRAL ELECTRONICS OPTIONS AND WIRING

4.1 Option /I

It provides the 4-20 mA current reference signal and the current monitor signal instead of the standard 0÷10 V. It is normally used in case of long distance between the machine control unit and the valve or where the reference signal can be affected by electrical noise. In case of breakage of the reference signal cable, the valve functioning is disabled.

4.2 Option /Q

Safety option providing the possibility to enable or disable the valve functioning without cutting the power supply.

4.3 Option /Z

Safety option, specifically introduced for -BC and -BP communication interfaces, provides two separated electric power supplies for the digital electronic circuits and for the solenoid power supply stage. The Enable and Fault signals are also available. The option /Z allows to interrupt the valve functioning by cutting the solenoid power supply (e.g. for emergency, as provided by the European Norms EN954-1 for components with safety class 2), but keeping energized the digital electronic circuits, thus avoiding fault conditions of the machine fieldbus controller.

For the electrical wiring, see tab. G115 and G205.

4.4 Option /C

The valve electronics is set to receive the 4÷20 mA feedback signal from the remote pressure transducer, instead of the standard 0÷10 V.

4.5 Integral electronics wiring

For the electric wiring shielded cables must be provided: the shield must be connected to the power supply zero **on the generator side**, see tab. **F003**

POWER SUPPLY CONNECTOR				
PIN	SIGNAL DESCRIPTION	-AE, -AES, -TERS, -AERS	-AE/I, -TERS/I, -AERS/I	-AE/Q
A	Power supply 24 V _{DC}	Stabilized: +24V _{DC}		
B	Power supply zero	Filtered and rectified: V _{rms} = 21 ÷ 33 (ripple max 2V _{pp})		
C	Signal zero	Reference 0 V _{DC}	Reference 0 V _{DC}	Enabling input normal working 9 ÷ 24 V _{DC}
D	Input signal +	0 ÷ 10 V _{DC}	4 ÷ 20 mA	0 ÷ 10 V
E	Input signal -			
F	Monitor driving current (for -AE, -AES) regulated pressure (for -TERS, -AERS)	0 ÷ 10 V referred to pin C (signal 0 V _{DC}) 1V = 1A 1V = 10% of regulated pressure	0 ÷ 5 V (-AE/I) 4 ÷ 20 mA (-TERS/I) 1V = 1A 4 ÷ 20 mA = 0 ÷ 100% of regulated pressure	0 ÷ 5 V referred to pin B (signal 0 V _{DC}) 1V = 1A -
G	Earth	Connect only when the power supply is not conform to VDE 0551 (CEI 14/6)		

COMMUNICATION INTERFACE CONNECTORS (-AES, -TERS, -AERS)				
Communication options	-PS (RS232) male connector	-BC (CAN Bus) male connector	-BP (PROFIBUS-DP) female connector (reverse key)	
Pin number Signal description	1	NC Not Connected	CAN_SHLD Shield	+5V Termination voltage
	2	NC Not Connected	NC Not Connected	LINE -A Bus line (high)
	3	RS_GND Signal zero data line	CAN_GND Signal zero data line	DGND Signal zero data line / termination voltage
	4	RS_RX Valves receiving data line	CAN_H Bus line (high)	LINE-B Bus line (low)
	5	RS_TX Valves transmitting data line	CAN_L Bus line (low)	SHIELD Shield

PRESSURE TRANSDUCER CONNECTOR (-AERS) see section 7		
PIN	standard version	option /C
1	Pressure signal	Pressure signal
2	Reserved (do not connect)	Reserved (do not connect)
3	Power supply	Power supply
4	GND	Reserved (do not connect)

Note:

- electrical signals (e.g. feedback signals) acquired via valve electronics must not be used to switch off the machine safety functions. This is in accordance with the European standards (Safety requirements of fluid technology systems and components - hydraulics, EN 982).
- installation notes with basic information for commissioning and start-up are always supplied with the relevant components, together with the specific technical tables.

4.6 Model codes of power supply and communication connectors

VALVE VERSION	-A	-AE, -AES, -TERS, -AERS		-AES/Z, -TERS/Z, -AERS/Z	-RS232 (-PS) OR CANBUS (-BC)	PROFIBUS (-BP)	PRESSURE TRANSDUCER only for AERS
CONNECTOR CODE	SP-666	SP-ZH-7P (1)	SP-ZM-7P (1)	SP-ZH-12P (1)	SP-ZH-5P (1)	SP-ZH-5P/BP (1)	SP-ZH-4P-M8/5 (1)(2)
PROTECTION DEGREE	IP65	IP67	IP67	IP65	IP67	IP67	IP67

(1) to be ordered separately (2) M8 connector moulded on cable 5 mt length

5 PROGRAMMING DEVICES

The functional parameters of the digital valves, as the bias, scale, ramp and linearization of the regulation characteristic, can be easily set and optimized with graphic interface by using the following software programming devices suitable for standard PC:

KIT-E-SW-PS for electronics with RS232 interface (option **-PS**)

KIT-E-SW-PS-TERS only for -TERS-PS electronics - simplified version of KIT-E-SW-PS with only bias and scale settings.

KIT-E-SW-PS-TERS/U as KIT-E-SW-PS-TERS with serial to USB interface

KIT-E-SW-BC for electronics with CANbus interface (option **-BC**)

KIT-E-SW-BP for electronics with PROFIBUS-DP interface (option **-BP**)

see tab. G500 for complete information about the programming device kits and for the PC minimum requirements.

Only for the -BC and -BP communication options, the functional parameters can be alternatively set via fieldbus through the machine control unit, using the standard communication protocol implemented by Atos.

The protocol operating instructions to be implemented in the standard protocols (DS301V4.02, DSP408 for CANbus and DPVO for PROFIBUS-DP) are described in the user manuals MAN-S-BC (for -BC option) and MAN-S-BP (for -BP option) supplied with the relevant programming device kits.

The above programming devices have to be ordered separately.

6 DIAGRAMS (based on mineral oil ISO VG 46 at 50 °C)

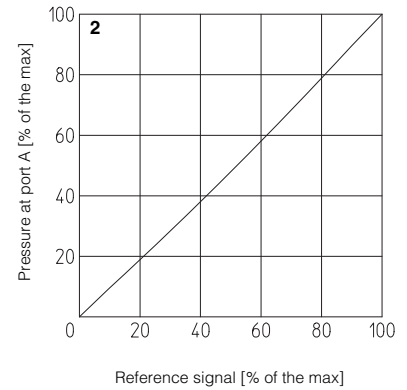
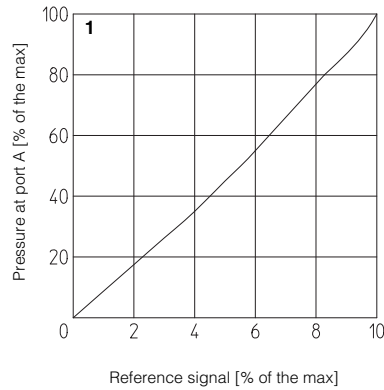
6.1 Regulation diagrams

with flow rate Q = 10 l/min

- 1** = AGRCZO-A, AGRCZO-AE; AGRCZO-AES
2 = AGRCZO-TERS, AGRCZO-AERS

Notes:

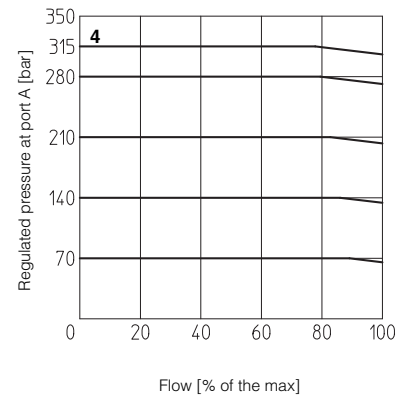
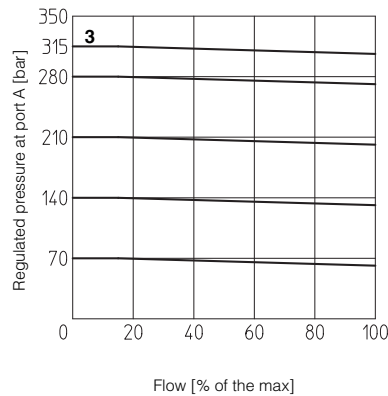
- 1) For the valves with digital electronics the regulation characteristic can be modified by setting the internal software parameters, see tab. G500.
 2) For valves type -A, -AE and -AES the presence of counter pressure at port T can alter the effective pressure regulation.



6.2 Pressure/flow diagrams

with reference pressure set with Q = 10 l/min

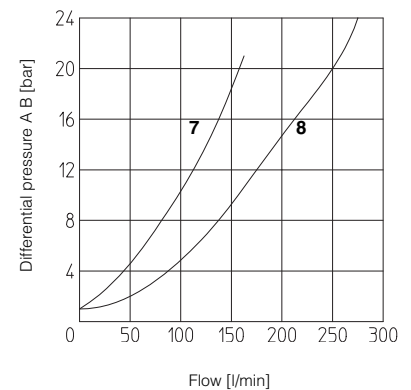
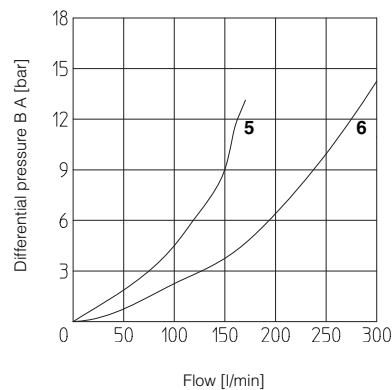
- 3** = AGRCZO-A, AGRCZO-AE, AGRCZO-AES
4 = AGRCZO-TERS, AGRCZO-AERS



6.3 Pressure drop/flow diagrams

with reference signal "null"

- 5** = AGRCZO-*-10
6 = AGRCZO-*-20
7 = AGRCZO-*-10*/R
8 = AGRCZO-*-20*/R



6.4 Dynamic response

The response times in section 2 have to be considered as average values.

The integral closed loop control of -TERS and -AERS valves is affected by the stiffness of the hydraulic circuit: greater is the stiffness of the circuit, the better are the performances. The valves dynamic performances can be optimized depending on the stiffness characteristics of the hydraulic circuit, by setting the internal software parameters. This regulation is particularly helpful in case of circuits with accumulators and/or with great fluid volumes and/or with long hoses.

ISO 5781: 2000

Mounting surface: 5781-06-07-0-00

Fastening bolts:

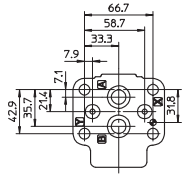
4 socket head screws M10x45 class 12.9

Tightening torque = 70 Nm

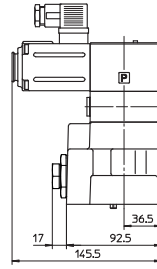
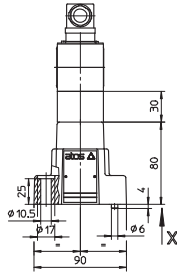
Seals: 2 OR 109/70 ; 2 OR 3068

Diameters of ports A, B: $\varnothing = 14$ mm

Diameters of ports X, Y: $\varnothing = 5$ mm

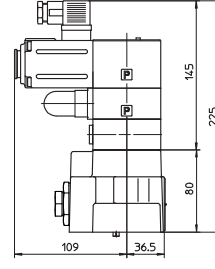


AGRCZO-A-10



Mass: 5 Kg

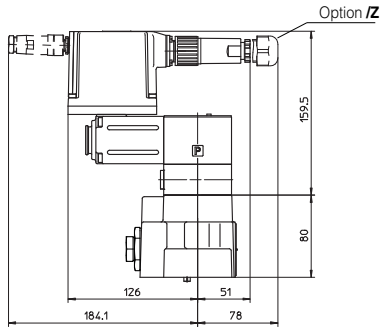
AGRCZO-A**/P



Mass: 5,5 Kg

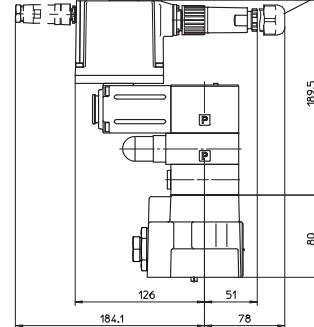
AGRCZO-AE-10

(-AES-* dotted line)



Mass: 5,6 Kg

Option Z

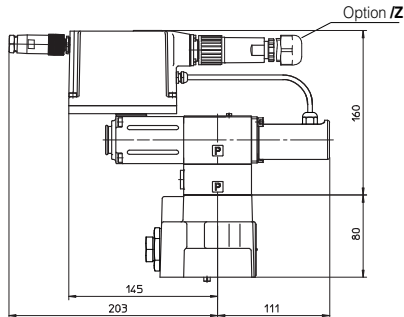


AGRCZO-AE-10***/P

(-AES-* dotted line)

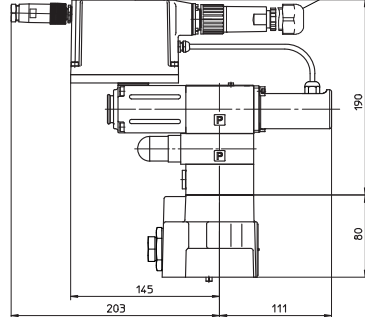
Mass: 6,1 Kg

AGRCZO-TERS*-10



Mass: 5,9 Kg

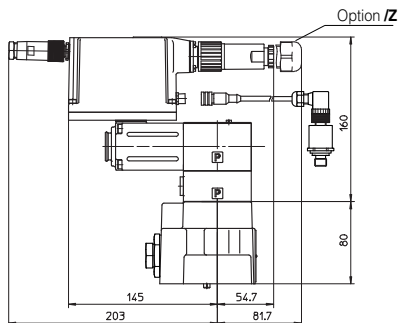
Option Z



AGRCZO-TERS*-10***/P

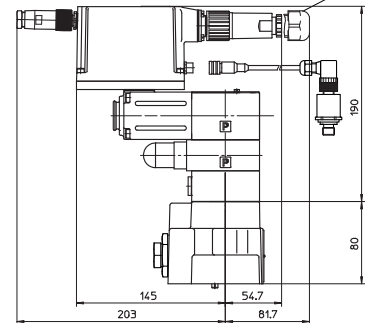
Mass: 6,4 Kg

AGRCZO-AERS*-10



Mass: 5,7 Kg

Option Z

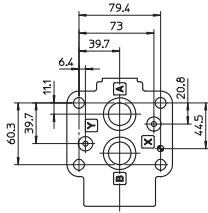


AGRCZO-AERS*-10***/P

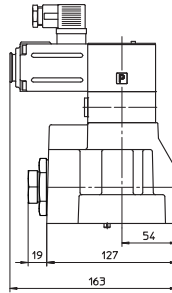
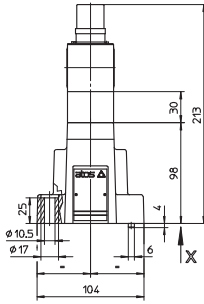
Mass: 6 Kg

ISO 5781: 2000
Mounting surface: 5781-08-10-0-00

Fastening bolts:
 4 socket head screws M10x45 class 12.9
 Tightening torque = 70 Nm
 Seals: 2 OR 109/70 ; 2 OR 4100
 Diameters of ports A, B: $\varnothing = 22$ mm
 Diameters of ports X, Y: $\varnothing = 5$ mm

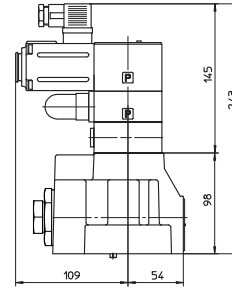


AGRCZO-A-20



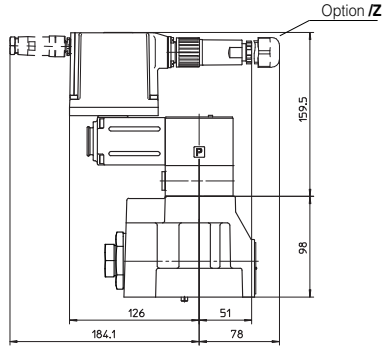
Mass: 7,5 Kg

AGRCZO-A//P**



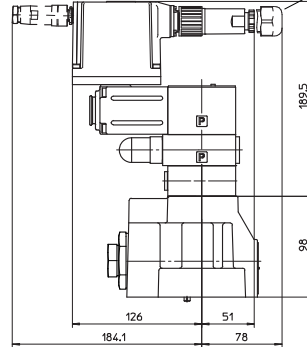
Mass: 8 Kg

AGRCZO-AE-20
 (-AES-* dotted line)



Mass: 8,1 Kg

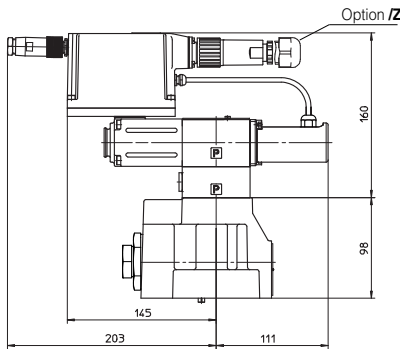
Option *I*Z



Mass: 8,6 Kg

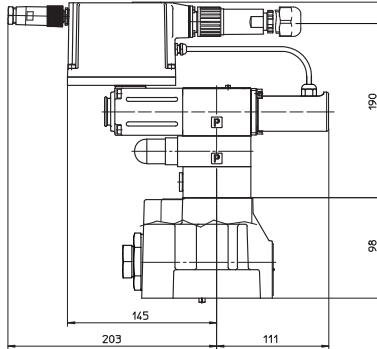
AGRCZO-AE-20/*/P**
 (-AES-* dotted line)

AGRCZO-TERS-*-20



Mass: 8,3 Kg

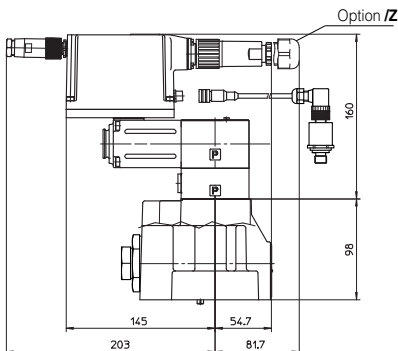
Option *I*Z



Mass: 8,8 Kg

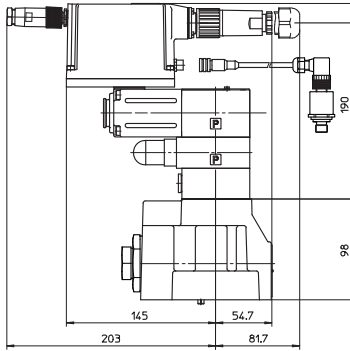
AGRCZO-TERS-*-20/*/P**

AGRCZO-AERS-*-20



Mass: 8,2 Kg

Option *I*Z



Mass: 8,7 Kg

AGRCZO-AERS-*-20/*/P**

9 ELECTRONIC DRIVERS FOR AGRCZO

Valve model	-A				-AE	-AES	-TERS	-AERS
Drivers model	E-MI-AC-01F	E-BM-AC-01F	E-ME-AC-01F	E-RP-AC-01F	E-RI-AE	E-RI-AES	E-RI-TERS	E-RI-AERS
Data sheet	G010	G025	G035	G100	G110	G115	G205	

For complete information about the drivers characteristics and relevant options, see the technical data sheet specified in the table.

10 MOUNTING PLATES

Size	Model	Ports location	Gas ports A, B (X, Y)	Ø Counterbore [mm] A, B (X, Y)	Mass [kg]
10	BA-305	Ports A, B (X, Y) underneath	1/2" (1/4")	30 (21,5)	1
20	BA-505	Ports B, (X,Y) underneath	1" (1/4")	46 (21,5)	2

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