LINEAR AND PROPORTIONAL ELECTRIC ACTUATORS FOR METERING PUMPS

SERIES **Z**

ORIGINAL INSTRUCTIONS TRANSLATION

ATTENTION: Industrial equipment not intended for use by not professional personnel.
These instructions are for skilled personnel only.

TYPE ZC-ZP

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OPERATING MANUAL

English

OBL / JOB No.					
CUSTOMER					
CUSTOMER ORDER No.					
ELECTRIC ACTUATOR MODEL					
ANNEXES					
ITEM/S					
SERIAL N°					

TABLE OF CONTENTS

ENGLISH

GB

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1. FOREWORD

The purpose of these instructions is to supply the necessary information to know and make easier start-up, use and maintenance operations of **Z Series** electric actuators.

These "instructions" are meant for machines **being used in industrial areas only**, therefore they cannot be treated as retail products. Hence the information herein contained should be used **only by qualified personnel**. **These instructions must be integrated by provisions of the law and technical regulations in force**, they do not substitute any plant regulation and any other additional safety rules that may be issued.

Special-purpose or non-standard actuators may differ in details from those here described.

In case of difficulties, we recommend to contact OBL Customer Service specifying the following information which can be found on both on the electric actuator and on the pump name plate (see "Nameplate data"):

- type of metering pump where it is installed (complete model number)
- type of electric actuator (complete model number)
- serial number of the pump or of the actuator
- OBL job n° (as an alternative to the serial number)

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1.1 ACTUATORS RANGE OF APPLICATION

The design ambient temperature "Ta" of these machines can be:

–5°C ⩽ Ta ⩽ +40°C (65% RH humidity): Standard for all type of actuators **WITHOUT anti-condensation heater**

–20°C ⩽ Ta ⩽ +65°C (100% RH humidity): On request and only for actuators **WITH anti-condensation heater**

All OBL electric actuators are suitable for both 50 Hz and 60 Hz supply.

ATTENTION: "Z" Series electric actuators are not suitable to be used in potentially explosive areas !

PLEASE NOTE: These instructions must be observed along with those contained in the operating manual of the metering pump.

2. SAFETY WARNINGS

These instructions must be carefully studied before the start-up of the pump on which the actuator is installed. Non-observance of safety warnings can damage the equipment and/or the running of it.

For a correct use and maintenance always follow the information here contained. It is important they are read by the installer and by the maintenance personnel. They must be kept in a dry and protected place, near the machine, available for an easy and quick reference.

Carefully check and keep in good and legible conditions the following indications presents directly on the equipment:

- Name plate

- Warning stickers and operating information

2.1 SYMBOLS AND RECOMMENDATIONS

This symbol refers to indications to help avoid damage and/or injuries to personnel.

This symbol indicates danger due to presence of electricity.

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This symbol indicates an explosion danger.

2.2 DANGER

Electric actuators have dangerous parts. Therefore:

- **a wrong use or tampering,**
- **protections removal** and disconnection of the protection devices,
- **lack of inspections and maintenance** may cause serious damages to people or things.

The personnel must be informed especially of the dangers coming from:

- **live parts**

The safety manager must make sure and guarantee that metering pump and electric actuator are set into operation, inspected, maintained and repaired **only by qualified personnel** having:

- a specific technical training and experience
- expertise of technical rules and applicable laws
- expertise of the general, national, local and plant safety prescriptions
- ability to recognize and avoid every possible danger

Failure to comply with these instructions, negligence and bad or improper use of the machines by unqualified and unauthorized staff, may result seriously dangerous for persons and things and will also cause OBL's guarantee cancellation.

A wrong use or tampering of the equipments may jeopardize their safety.

OBL actuators must be run only if in perfect technical conditions, also considering the matters relating to safety and danger; their regular running and operating life mostly depend on the steady compliance with these instructions.

OBL declines any responsibility for casualties and damages generated by the improper use of the actuators.

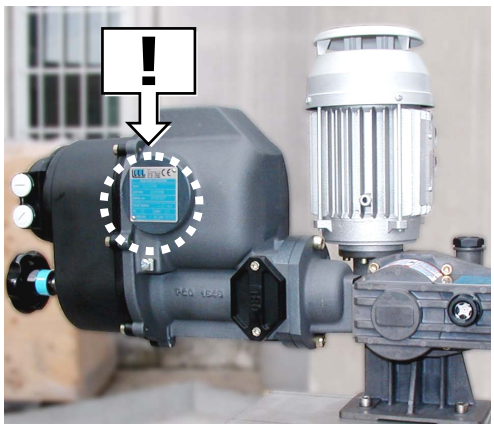
3. DESCRIPTION

Z Series actuators are supplied installed on OBL metering pumps only, since they are purposely designed to operate and control their adjusting system. Actuators can also be supplied as "replacement parts" for OBL dosing pumps only.

3.1 NAMEPLATE DATA

Each electric actuator comes with a nameplate, here you can see an example and it's position:

Actuator nameplate



Position of the nameplate

1 = Actuator's identification code	**2 =** OBL JOB number (order confirmation)
3 = Actuator's serial number	**4 =** Pilot signal range
5 = Motor power (Watt)	**6 =** Motor voltage (Volt)
7 = Actuator's Index of Protection	**8 =** Power supply frequency (Hertz)

Make sure that the data plate, the warning and service labels are always present, legible and in good condition. Otherwise replace them.

DO NOT ALTER OR REMOVE THE IDENTIFICATION NAMEPLATE FOR ANY REASON.

3.2 IDENTIFICATION CODE

Z Series electric actuators differ according to the type of position adjuster installed and the type of metering pump.

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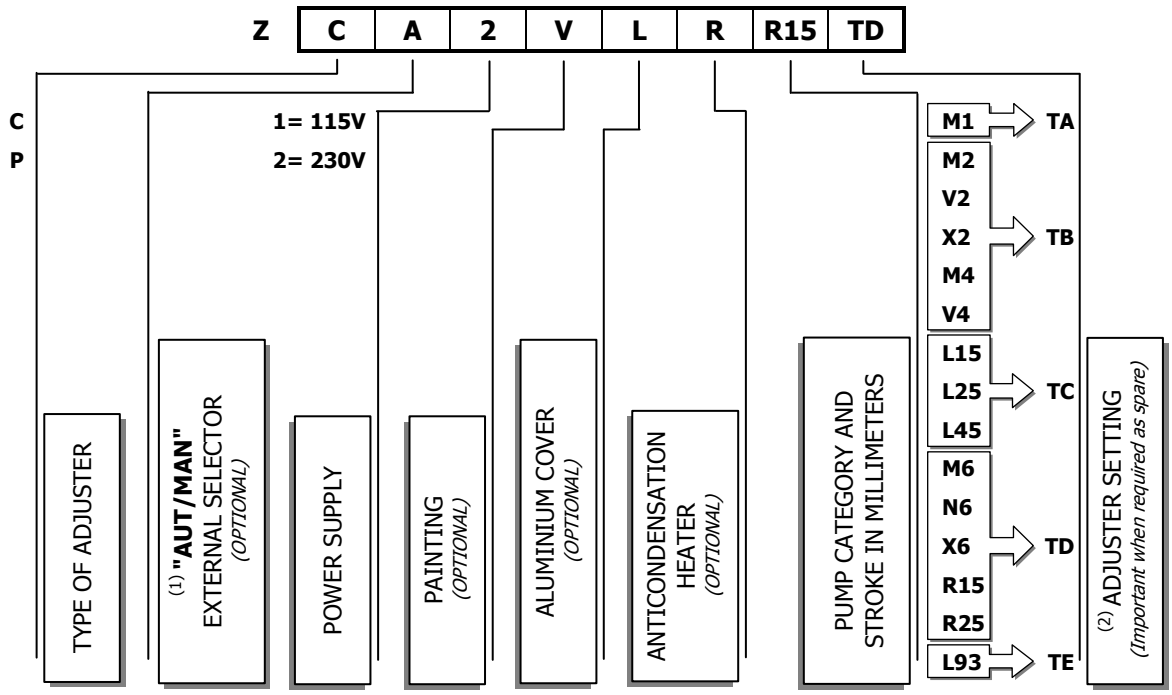
The identification code is engraved on the actuator nameplate and is composed by:



More information about the various position adjustments are available on the relevant technical specifications and electrical diagram of the enclosed operating manual.

(1) Optional equipment for actuator type ZC. Standard on actuator type ZP.

(2) Reported on the position adjuster label also.

IMPORTANT: In case of position adjuster replacing (or exchange between two actuators) verify the correct corrispondence between the adjuster calibration (see the label) and the electric actuator type (see the nameplate).

3.3 WORKING PRINCIPLE

Z Series electric actuators are linear and proportional type with protection degree IP66. They are entirely designed by OBL and are installed on their metering pumps.

A reference standard sectional drawing is enclosed.

While receiving a control signal, the adjustment spindle (Pos. 291) changes its position modifying the pump swept volume, hence its capacity per hour.

All actuators have an analogue dial indicating the percentage of the flow-rate (ranging from 0 to 100%).

A manual adjustment knob is fitted as standard for emergency override adjustments.

The clockwise or anticlockwise direction of rotation of the by-directional single-phase motor (Pos. 283) is controlled by the built-in position adjuster (Pos. 295) developed with microprocessor technology, connected to the gear reducer (Pos. 281) and integrated with a precision multiturning (10 kOhm) potentiometer (Pos. 282).

The gear reducer shaft moves the screw-nut screw system (Pos. 290) forcing the antiturn adjusting rod (Pos. 291 & Pos. 297) to shif axially. The system is lubricated for life; its motion is mechanically followed by the potentiometer (Pos. 282).

An anticondensation heater (Pos. 306) can be installed on demand.

All Z Series actuators can work either with the pump stopped or running. The adjusting system is protected from accidental overloads by means of a microprocessor, which also sends a remote alarm signal.

The wiring terminal box for electrical connections protects the internal motion cables from accidental entry of debris or unintentional damages. Construction material of external components guarantees high protection against shocks.
External surfaces are protected from corrosion.
All metal parts have been assembled maintaining a perfect earth connection.

3.4 PILOT SIGNAL

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According to the type of adjustment installed, Z series electric actuators can receive the following command signals:

- **Type C** position adjuser: (3) 4÷20 mA, 0÷20 mA; 20÷4 mA; 0÷10 V; Impulse frequency RS-485 serial port
- **Type P** position adjuser: PROFIBUS DP-V0 (File: OBL0A39.GSD)

(3) The command signal can be adjusted by means of the selector (dipswitch) on the position adjuser.

The command signal must respect the tolerances suggested for industrial appliances.

ATTENTION: A command signal greater than 30mA can cause serious damage to the position adjuster !

PLEASE NOTE: The command signal must be linear, interference free and without ripples !

3.5 ACTUATOR SPEED AND START UPS PER HOUR

ACTUATOR SPEED 0÷100%			**Start ups per hour (1)**		
Pump type	**Stroke length**	**Time**	**Command signal variations**		
			≤ 4mA	**≤ 12mA**	**≤ 20mA**
MB, MD, RB…, RC…, XR…, URM	1, 2, 4 mm	7 sec	300	250	200
MC, MD, RB…, RC…, XR…, URM	6 mm	20 sec	240	180	120
RB…, RC…, RIE, XL, URA, URB	15 mm	20 sec	240	180	120
RH, RM, LY, MLY, XL, XLB	25 mm	20 sec	240	180	120
LK, MLK, MLN, XLC	45 mm	20 sec	240	180	120
LN, LP	93 mm	42 sec	180	120	70

(1) WARNING: Avoid continuous, close, position adjustments around the same control signal value as it is unneccessary and it could damage the servo motor. Such fine adjustments are useless in trimming the accuracy of the dosing process.

Avoid using unstable command signals do not exceed the number of start-ups per hour as in the above table.

3.6 REMOTE SIGNALS

This type of signal can be received only if the electrical are made as shown on the typical wiring diagram relevant to the position adjuster installed (see "Electrical connections and start-up") further reference should be made to the electrical characteristics described in the technical specification.

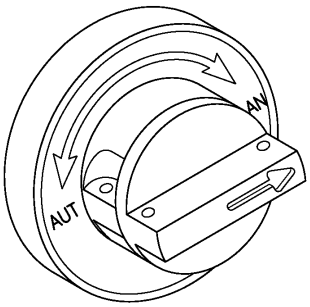
- **ZC electric actuator** by the terminal board once connected, sends an electro-mechanical "defect alarm", the alarm signal is sent
- **ZP electric actuator** sends information regarding the process and the operating conditions via the PROFIBUS port

3.7 MECHANICAL BLOCK SAFETY DEVICE

The motor is protected from overloads by the mechanical block safety device (on all actuators). It operates when an excess of thrust on the pump adjusting system or an uncorrected positioning occurs. The continuous-cycle device keeps the motor under voltage for 10 seconds, then cuts off the power for 30 seconds and sends a remote alarm signal.

N.B.: The electric actuator sounds an intermittent alarm. It signals for 30 seconds then pauses for 10 seconds.

3.8 SELETTORE ESTERNO "AUT-MAN"



Allows to adjust manually the actuator maintaining the feedback signal 4÷20mA, without disconnect the power supply or alter the internal dipswitch setting (actuator type ZC).
Can be found easily on the actuator, the holes on the dial can be used to lock the selector position.

- **AUT** position: **AUTOMATIC** operating mode, the stroke length adjustment varies according to the signal received.
- **MAN** position: **MANUAL** operating mode, the user can adjust the stroke length manually by means of the adjustment knob.

IMPORTANT: Please note, in ZC actuators should the internal dipswitch (on position adjuster) be set to "manual adjustment" the external "AUT-MAN" selector HAS NO EFFECT, i.e. is non functioning.

3.9 EMERGENCY MANUAL OVERRIDE

It allows to change the actuator position in case of electrical fault or lack of control signal.

It is possible to operate with the pump at rest **ONLY IF** the discharge pipe **IS NOT** pressurized and/or closed.

To maintain communication "activated", **BEFORE** acting on the manual adjustment system, set the actuator as follows:

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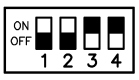
- With position adjuster **C type**: Turn the selector to **"MAN"** mode, or, set the internal dipswitch as follows:

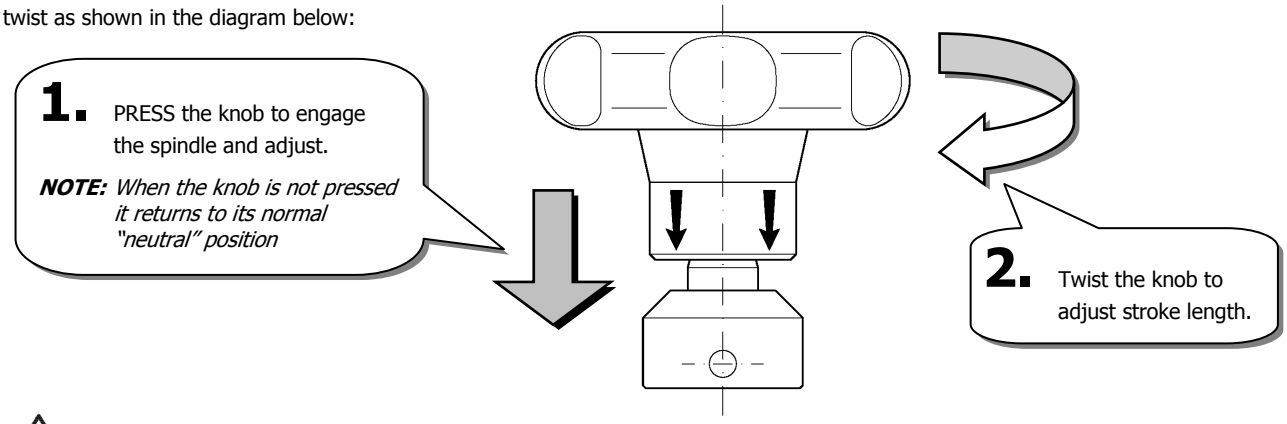


Note: ■ indicates the switch. This way during the manual adjustment the following functions are available: Feedback 4÷20 mA, General alarm signal, Anti-condensation heater supply (if any).

- With position adjuster **P type:** Turn the selector to **"MAN"**. During manual adjustment all PROFIBUS communication remains active.

Only manual adjustment is available when mains is not connected. PLEASE NOTE: Should the mains be re-connected the actuator will automatically adjust itself according to the signal received.

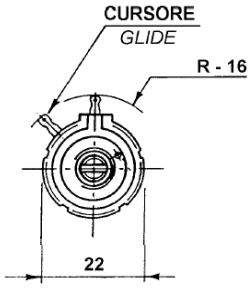
When operating in automatic mode the knob is in "neutral" position. In order to use the knob one must press downwards and then twist as shown in the diagram below:

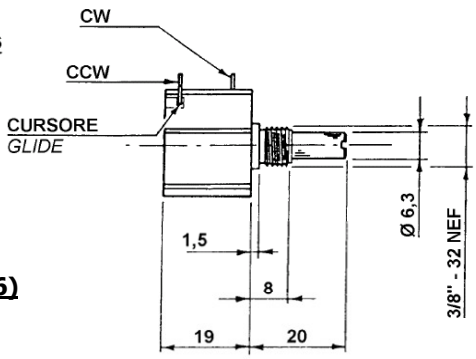


The manual override must be carried out slowly (max 20 Nm) avoiding sudden accelerations !

3.10 POTENTIOMETER TECHNICAL DATA (POS. 282)

Type:	Helipot Mexico 9010
Model:	7286
Range:	0 ÷ 10.000 Ohm
Linearity:	+/- 0,25 %
Stroke:	10 turns (+10° -0°)





3.11 ANTI-CONDENSATION HEATER TECHNICAL DATA (POS. 306)

Type:	Arcol - Serie HS	
Model:	DALE RH10	
Supplier:	Distrelec	
Isolation resistance:	10.000 MOhm min.	
Supply voltage:	**230 V c.a.**	**115 V c.a.**
Heater:	4.700 Ohm	2.200 Ohm
Rated power:	11W / 230 V c.a.	10W / 115 V c.a.
OBL code:	**KME28**	**KME30**

4. ZC ACTUATOR (RS-485 serial command) - [OBL Ref.: R8]

Pumps with a ZC electric actuator via the usual command signals traditionally used in industrial electrical equipment (see "Pilot signals") work in "stroke length control" mode.

The actuator can also work in "flow-rate control" mode but only if an RS-485 serial communication is being used.

If the user wants to operate in "flow-rate control" we recommend to perform the **calibration** (see " ZC actuator: On plant calibration procedure") or to record the data on the test report provided with the pump.

4.1 STROKE LENGTH CONTROL

During communication **the measurement unit is the pilot signal**. An electric signal at a rated current will cause the shaft adjustment to extend or retract proportionally through its full travel (the adjustment ranges from 0÷100%).

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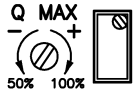
4.2 FLOW-RATE CONTROL

During communication between the central controller and servo **the measurement unit is the hourly capacity** (usually expressed in litres per hour). The controller tells the servo to position itself so that the pump delivers the required flow-rate (**before** operating in this mode, the user must have performed the plant calibration servo unit + pump).
The actuator replies to commands from an external Master.

4.3 FLOW-RATE LIMITER (Q.MAX TRIMMER)



The position adjuster for **ZC** actuator is equipped with a potentiometer called (Q.max) trimmer; which can reduce the pump maximum flow-rate (corresponding to 20 mA command signal) up to 50% of the nameplate rated capacity.

4.4 EXAMPLE ON HOW TO ADJUST AND SET THE FLOW-RATE LIMITER (Q.MAX TRIMMER)

Pump quoting a maximum flow-rate of 120 l/h, as mentioned previously, 120 l/h will be obtained at 20mA i.e. highest command signal valuel. The process only requires 84 l/h at 20mA that corresponds with 70% of the rated capacity of the pump. Act as follows:

- Send a command signal of 20 mA. The actuator is positioned at 100%
- Remove the terminal cover (Pos. 279). Turn the Qmax trimmer so to reach 70% on the position indicator
- Put the terminal cover back on. The actuator is now ready to work so that with 20 mA of pilot signal the max flow-rate of the pump is the 70% of his flow-rate on the nameplate.

The position indicator values always refer to the max pump flow-rate, i.e. the capacity quoted on the nameplate.
The feedback signal values always refer to the Qmax trimmer setting.

Q.max trimmer setting	Command signal value		Position indicator	Pumps' flow-rate	Feedback signal value	
100%	20 mA	*(100%)*	100%	120 l/h	20 mA	*(100%)*
70%	20 mA	*(100%)*	70%	84 l/h	15,2 mA	*(70%)*
50%	20 mA	*(100%)*	50%	60 l/h	12 mA	*(50%)*

4.5 LED SIGNAL

On all **ZC** actuators there is an LED (red) indicating the general operating conditions, the LED is to be found on the postion adjuster.
Remove terminal box cover (Pos. 279) to view the LED on the position adjuster.
Refer to the following table to find out the various messages and causes:

LED Status	Means	Reason - Cause
Flashing SLOW (1Hz)	**OPERATING conditions OK**	Normal condition
Flashing FAST (5Hz)	**General Alarm** (NO alarm on 12 terminal for R1 external relay)	Potentiometer not connected or broken
OFF	**General Alarm** (Alarm contact on 12 terminal for R1 external relay)	Servo actuator switched off or fuse is blown
On permanently for 30 seconds, then flashing for 10 seconds (1Hz)	**General Alarm** **Protection for mechamical block is ACTIVE** (Alarm contact on 12 terminal for R1 external relay)	Motor failure or mechanical fault of the position adjustment
Permanently ON	**General Alarm** (Alarm contact on 12 terminal for R1 external relay)	External selector set on "MAN" or internal Dipswitch set on "MANUAL"
Permanently ON	**General Alarm** (Alarm contact on 12 terminal for R1 external relay)	Command signal non present or out of range: ≤ 3,2mA or ≥ 20,8mA **(1)**

(1) ATTENTION: A command signal greater than 30mA can cause serious damage to the position adjuster !

4.6 RS-485 COMMUNICATION PROTOCOL

RS-485 communication protocol follows.

4.6.1 Messages format

Checksum +1	Address	Parameter	Byte 3	Byte 2	Byte 1	Byte 0	Checksum +1

Messages have a fixed length; the meaning of each byte is the following:

1) Checksum+1 Sum of the messages bytes +1.

2) Address: Specify to which knot the message is addressed. The address 0x00 is the jolly address for baud rate changing. The heaviest bit of the address specifies the type of message (Writing = 1; Reading = 0).

3) Parameter: Hexadecimal parameter number.

4) Byte Bytes of the parameter value. 8 bytes parameters are transmitted as 2 four bytes parameters.

5) Checksum+1 Bytes sum in the message+1, rejected.

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4.6.2 Request messages from the "Master" (usually PC or PLC)

The instrument is equipped with a 256 bytes receipt buffer. It is anyhow recommended to wait for the instrument answer before making a new request.

Parameter	Byte 3	Byte 2	Byte 1	Byte 0	Function
Parameter number	0x00	0x00	First byte of the value to be written (heavier)	Second byte of the value to be written (lighter)	Writing of a 2 bytes parameter
Parameter number	First byte of the value to be written (heavier)	Second byte of the value to be written	Third byte of the value to be written	Fourth byte of the value to be written (lighter)	Writing of a 4 bytes parameter
Parameter number	0x00	0x00	0x00	0x00	Reading of a 2 or 4 bytes parameter

4.6.3 Feedbacks from the position adjuster

- No answer (time-out 100 ms) : The message checksum received is wrong
- No answer (time-out 100 ms) : Modification message of the baud rate
- Answer with "0" value (closed access) : Non-opening with password
- Answer with "1" value (Not allowed) : The operation is not allowed
- Answer with "2" value (OK) : Operation correctly performed

Parameter	Byte 3	Byte 2	Byte 1	Byte 0	Function
Parameter number	OK	0x00	0x00	0x00	Confirm the correct execution of the writing message
Parameter number	First byte of the requested parameter value (heavier)	Second byte of the requested parameter (lighter)	First byte of the parameter status value (heavier)	Second byte of the status parameter value (lighter)	Reading of a 2 bytes parameter. Sends back the requested parameter value and gives the parameter status value.
Parameter number	First byte of the requested parameter value (heavier)	Second byte of the requested parameter value	Third byte of the requested parameter value	Fourth byte of the requested parameter (lighter)	Reading of a 4 bytes parameter. Sends back the requested parameter value.

4.6.4 Parameters table

Par	Acronym	DESCRIPTION	Type	Byte	Range	Default	Unit	Format
0	COD	Customer access code "0" = cancellation of code request	W		0 - 4.294.967.295	0	n.	Binary
1	TAG1	Plant nameplate	R/W	4	---	0	text	ASCI
2	TAG2	Plant nameplate	R/W	4	---	0	text	ASCI
3	OBL	Manufacturer's name	R/W	4	---	OBL	text	ASCI
4	MOD	Model number	R/W	4	---	0	text	ASCI
5	SER1	Equipments series number	R/W	4	---	0	text	ASCI
6	SER2	Equipments series number	R/W	4	---	0	text	ASCI
7	FIRM	Firmware version	R/W	4	---	0	text	ASCI
8	NS	Instrument node – from 1 to 31	R/W	1	1 ÷ 31	1	n.	Binary
9	BRC	Baud Rate of communication	R/W	1	2,4 ÷ 9,6	9600	code	Binary
10	VPA	High position value	R/W	2	0 – 1000	1000	%*10	Binary
11	VPB	Low position value	R/W	2	0 – 1000	200	%*10	Binary

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Par	Acronym	DESCRIPTION	Type	Byte	Range	Default	Unit	Format
12	PPA	Pump high capacity	R/W	2	0 – 65535	100	l/h*10	Binary
13	PPB	Pump Low capacity	R/W	2	0 – 65535	20	l/h*10	Binary
14	PIP	Pump instantaneous capacity	R	2	0 – 65535	n/a	l/h*10	Binary
15	SPS	Set-point serial capacity	R/W	2	0 – 65535	0	l/h*10	Binary
16	VPM	Motor position value	R	2	0 ÷ 1000	n/a	%*10	Binary
17	VSC	Pilot signal value	R	2	0 ÷ 1000	n/a	%*10	Binary
18	QMAX	Ratio "Full scale / Pump capacity"	R	2	500 ÷ 1000	1000	%*10	Binary
19	COS	Actuator operation control Value 1 = Start setting Value 2 = End setting Value 3 = Control from hardware (%) Value 4 = Signal from serial (l/h) Value 5 = Control of position (%) Value 6 = Control of capacity (l/h) Value 7 = Access closing Value 8 = Reset	W	1	0000 ÷ FFFF	 0 0 0 0 0 0 0 0	n/a	Binary
20	FSF1	Frequency signal full scale 1 (0-2 Hz)	R/W	2	Not defined	20	Hz*10	Binary
21	FSF2	Frequency signal full scale 1 (0-30 Hz)	R/W	2	Not defined	300	Hz*10	Binary
22	STATUS	Instruments status Bit 0 = "Increase" motor running Bit 1 = "Decrease" motor running Bit 2 = Signal from hardware (0) / from serial (1) Bit 3 = Position check % (0) / capacity l/h (1) Bit 4 = Failure alarm (1) Bit 5 = Customer access closed (0) / open (1) Bit 6 = Shop access closed (0) / open (1) Bit 7 = Normal operation (0) / setting (1)	R	1	0000 ÷ FFFF	 n/a n/a 0 0 n/a 1 0 0	n/a	Binary
23	FSP	Input and output signals capacity full scale	R/W	2	0 – 65535	1000	l/h*10	Binary
24	FMPT	Pump Motor Frequency during calibration	R/W	2	0 - 200	50	Hz	Binary
25	FMPE	Pump Motor Frequency during duty	R/W	2	0 - 200	50	Hz	Binary

4.6.5 Access procedures by passwords

The access to writing parameters can be protected with a numeric password from 1 to 4.294.967.295. By selecting a "0" value the password is not required and the access is always open. All parameters are always available for reading. Parameters from 3 to 7 are always protected even though the password request is not required. The instrument responds with "0" value (close access) to a writing request at a close access.

a) To open the access

Write the password in parameter 0; the system compares it with the password memorized value:

- if OK, access is given, it writes 1 in bit 5 of par 22 and answers with value "2" (open access).
- if not OK, access is denied, bit 5 of par 22 remains zero and answers with value "0" (closed access).

If the password is forgotten, please contact OBL Customer Service. The equipment is supplied without a password request.

b) To change the password

Once the access has been opened, write the new password.

c) To close the access

The access automatically closes 3 minutes after the last communication. To get an immediate closing send a value "7" (parameter 19).

4.6.6 Setting up of operating controls (parameter 19)

Value 1 – Beginning of calibration The system automatically switches to "serial command" and "% position control" needless of any other commands and prepares to accept the parameters for calculating the flow rate received at the end of calibration.

The system automatically changes the value of Bit 7, parameter 22 (STATUS)

When the device is not in calibration mode all the VPA, VPB, PPA, PPB and FMPT parameters received are ignored.

Value 2 - End of calibration The system automatically passes to the previous check without sending a second command (value 3 if necessary). The new parameters for calculating the flow rate are accepted PIP (PPA, PPB, VPA, VPB, FMPT).

Value 3 – Hardware control	The system checks the actuator on the ground of the inlet control signal (mA / V / Hz). The type of control (% or l/h) is executed by command 5 and 6.
Value 4 – Serial control	The system checks the actuator on the ground of the capacity set point value (SPS) at parameter 15.
Value 5 – Check of % position	Stroke adjustment in % (traditional method) is carried out through a hardware selected control. The inlet control signal (in %) multiplied by the Qmax value corresponds to the requested actuator position value (in %).
Value 6 – Check of l/h capacity	Capacity adjustment in l/h is carried out through a hardware selected control. The inlet control signal corresponds to the capacity from 0 to the full scale value at parameter 23.
Value 7 – Access closing	Close the access to writing the parameters.
Value 8 - Reset	Reset the program.

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4.7 ZC ACTUATOR: ON PLANT CALIBRATION PROCEDURE

The conditions of the plant where the pump is to be installed can vary due to physical reasons and hydraulic reasons i.e. the dimensions and the shape of the pipeline affect the pumps working conditions and also the amount of backpressure, friction loss and of course the type of fluid dosed, etc. This calibration procedure allows the pumps performance to be dimensioned with its real working conditions on the plant.

NOTICE: The plant calibration can only be performed through the RS 485 serial line.

WARNING: Should the pump motor be fitted with an inverter, the flow-rate test must be performed keeping the power frequency of the motor constant.

- Enter calibration mode command signal (write 1 in paramenter COS)

1) High value calibration

- Send the SPS value corresponding to 100% of stroke adjustment
- Wait for the actuator to reach the position
- Read the exact value of the position parameter VPM and enter it in **VPA** parameter
- Measure the actual flow rate of the pump (in l/h) and enter value in **PPA** parameter

2) Low value calibration

- Send an SPS signal corresponding to approximately 20÷30% of the maximum rated flow rate (capacity) of the pump (check the test report of the pump, if available)
- Wait for the servo actuator to reach the position
- Read the exact value of the VPM position parameter and save it in **VPB** parameter
- Measure the actual flow rate of the pump (in l/h) and enter the value in **PPB** parameter

3) Ending of the operation

- Enter the frequency value of the pumps' electric motor (FMPT)
- Enter the command to end calibration (write 2 in COS parameter)

5. ZP ACTUATOR (PROFIBUS DP-V0 command) - [OBL Ref.: R12]

The servo ZP using PROFIBUS-DP-V0 protocol that offers high speed data transmission at a low cost. Pumps equipped with servo ZP can either act on the field in "stroke length control" or in "flow-rate control" (according to VPA, VPB, PPA, PPB parameters setting).
Are calibrated at the factory with default values that correspond to the "stroke length control" mode; from 0% to 100% of the stroke Set-point (SPS) from 0 to 1000.
If the user wants to operate in "flow-rate control" mode we recommend to perform the calibration (see "ZP actuator: On plant calibration procedure") or to record (on VPA, VPB, PPA, PPB parameters) the data on the test report provided with the pump.

NOTICE: All ZP servo actuators are tested in "stroke length control" mode. No data regarding "flow-rate control" is stored.

5.1 STROKE LENGTH CONTROL

During communication between central controller and servo actuator **the unit of measurement is the stroke length adjustment** (expressed in percentage from 0 to 100). The controller tells the servo to position the adjustment at the value required.

5.2 FLOW-RATE CONTROL

During communication between the central controller and the servo actuator, **the unit of measurment is the flow-rate** (usually expressed in litres per hour). The controller tells the servo to set the position so that the pump delivers the required **flow-rate** value (**before** operating in this mode, the user must perform the on plant calibration i.e. servo unit + pump).

5.3 PROFIBUS OVERVIEW

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PROFIBUS® is a field bus used in many applications to control and diagnose electrical equipment and is vastly used also in building automation.

With PROFIBUS protocolls, equipments (the "devices") from different manufacturers can exchange information on the same communication line (the "bus") using an high speed serial ports, without having to make special adaptations interface.

The transmission metod of PROFIBUS DP (Decentralised Peripherals) is based on the well established RS-485 technology, which use as a connection tools a fully shielded twisted pair cable.

The comunication protocoll PROFIBUS-DP (Decentralised Peripherals) guarantee high speed data exchange and is commonly used for complex electrical equipment with external supply.

The central controller, also known as "master" (usually a PC or PLC) uses the PROFIBUS-DP protocol as a rapid connection with other devices on the field (slaves) such as actuators, pumps, controllers for PROFIBUS net.

The master cyclically receives and reads the information from each slave in a definite order.

When you configure the bus structure, the user assigns an address between 0 and 125 to each slave, and also defines which of them to include or exclude from the cycle of data acquisition.

Communication functions are determined by the performance level of the DP-V0. DP-V0 means that the data exchange is easy, fast and cyclical process between the master and slave devices allocated.

The bus structure allows you to add and remove equipment or start the system "step by step", without involving other devices. This means that successive enlargements of the bus structure do not affect in any way the devices already in use.

The technology of the PROFIBUS-DP are available data rates ranging from 9.6 kbit / sec and 12 Mbit / sec. When booting the system selects a single data rate valid for all devices on the bus structure.

The PROFIBUS protocol not only provides comprehensive information on the process, but also gives access to configuration and operational conditions and maintenance of individual and multiple devices in the field.

The protocol offers the PROFIBUS GSD file for the integration of open systems, allowing you to configure communication with the various cyclical and slave devices also saving time and money when you design the control system. Each entry describes a function supported by the device (or devices) to which the file relates.

By keywords the configuration tool reads the device ID, the adjustable parameters, the corresponding data type and value limits permitted by the GSD file of the device.

Some keywords are mandatory, for example, "Name_supplier"; others are optional, for example, "Mode_sync_supported".

For more information on the PROFIBUS www.profibus.com consult the Web site.

5.4 INSTALLING DEVICES

Creating or implementing a bus structure ("line"), you can connect up to 32 devices (master or slave) to create a "segment".

Each end of a segment must have an active resistor bus. Both terms must always be power supplied to ensure a trouble-free operation.

You can use up to three amplifiers in the bus line (repeaters) and thus expand the network to a total of four segments, to install up to a maximum of 125 devices in the system.

5.5 CABLE LENGTHS

The maximum cable length is determined by the transmission speed (view table below). It is possible to increase the cable length provided that signal repeaters are installed, we suggest to fit no more than 3 repeaters on one line.

Transmission speed (bit/sec)	Maximum segment length (m)	Maximum cable length of overall network (m)
9,6 K ÷ 93,75 K	1200	4800
187,5 K	1000	4000
500 K	400	1600
1,5 K	200	800
3 M ÷ 12 M	100	400

5.6 GSD FILE: INTEGRATING DEVICES

To integrate the **ZP** servo bus structure using a GSD file Definitor (file OBL0A39.GSD) conforms to the standards of the consortium PROFIBUS, assigned and uniquely identified.

File GSD (Generic Station Description) file is an ASCII text file that allows the configurator tool PROFIBUS to add the actuator in the structure of the bus and automatically use the information relating thereto.

This file describes clearly and comprehensively the actuator in a format well-defined. This file lists the properties, specifications, and its communication skills and also additional information such as diagnostic values.

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⚠ **The GSD file (OBL0A39.GSD) is always supplied with the ZP servo actuators and is also downloadable from OBL's website. For further information contact our sales office or contact OBL Services and support office.**

5.7 "RES" BUTTON AND LED SIGNAL

As to PROFIBUS requirements, all **ZP** servos position adjuster are equipped with:

- "Res" button: That resets the servo actuators address
- Signal led: Indicating the working condition of the servo actuator

Remove terminal box cover (Pos. 279) to view the LED on the position adjuster.

For the interpretation of possible signals consult the wiring diagram or technical specification of the **P type** position controller attached to this operating manual.

More detailed information on "PROFIBUS Profile Guidelines refer to: Part 3 Diagnosis and Alarms" or website www.profibus.com.

5.8 PROFIBUS-DP-V0 COMMUNICATION PROTOCOL

The communication protocol used is the standard PROFIBUS-DP-V0, it consists of two communication modules as follows:

5.8.1 Modulo "A" (5 IN, 5 OUT)

5 INPUT BYTES (read by master):

0	1	2	3	4
PIPH	PIPL	VPMH	VPML	STATUS

PIPH = Instantaneous flow rate in (litres/hour) - byte high

PIPL = Instantaneous flow rate in (litres/hour) - byte low

VPMH = Motor position value in thousandths (max = 1000 = 100%) - byte high

VPML = Motor position value in thousandths (max = 1000 = 100%) - byte low

STATUS = Status Byte

Status byte description:

Bit	0	1	2	3	4	5	6	7
	MotL	MotR	X	X	All	X	Cal	Auto

MotL = Moving motor to maximum

MotR = Moving motor to minimum

X = Not used

X = Not used

All = Alarm

Cal = Calibration active

Auto = Automatic control

5 BYTES OUTPUT (written by master in the device):

0	1	2	3	4
SPSH	SPSL	COSH	COSL	FREQES

SPSH = Set point of pump flow rate (in liters/hour) – byte high

SPSL = Set point of pump flow rate (in liters/hour) - byte low

COSH = Servomotor command - byte high (not used)

COSL = Servomotor command - byte low (used)

FREQES = Power supply Frequency of pump on duty

Description COSL:

Bit 0 = Not used

Bit 1 = Reset parameters and board

Bit 2 = Reset board

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5.8.2 Module "B" (14 IN, 14 OUT)

The second communication module is made up as follows:

14 BYTES INPUT(read from master):

0	1	2	3	4	5	6
PIPH	PIPL	VPMH	VPML	STATUS	VPAH	VPAL

PIPH = Same as Module "A"

PIPL = Same as Module "A"

VPMH = Same as Module "A"

VPML = Same as Module "A"

STATUS = Same as Module "A"

VPAH = Calibration high position value (in thousandths) - byte high

VPAL = Calibration high position value (in thousandths) - byte low

7	8	9	10	11	12	13
VPBH	VPBL	PPAH	PPAL	PPBH	PPBL	FREQCAL

VPBH = Calibration low position value (in thousandths) - byte high

VPBL = Calibration low position value (in thousandths) - byte low

PPAH = High flow rate value in calibration - byte high

PPAL = High flow rate value in calibration - byte low

PPBH = Low flow rate value in calibration - byte high

PPBL = Low flow rate value in calibration - byte low

FREQCAL = Power supply Frequency of pump in calibration

14 BYTES OUTPUT (written by master in the device):

0	1	2	3	4	5	6
SPSH	SPSL	COSH	COSL	FREQES	VPAH	VPAL

SPSH = Same as Module "A"

SPSL = Same as Module "A"

COSH = Servomotor command - byte high (not used)

COSL = Servomotor command - byte low (used)

FREQES = Power supply Frequency of pump on duty

VPAH = High position value in calibration (in thousandths) - byte high

VPAL = High position value in calibration (in thousandths) - byte low

COSL description:

Bit 0 = Calibration mode active

Bit 1 = Reset parameters and board

Bit 2 = Reset board

7	8	9	10	11	12	13
VPBH	VPBL	PPAH	PPAL	PPBH	PPBL	FREQCAL

VPBH = Low position value in calibration (in thousandths)- byte high

VPBL = Low position value in calibration (in thousandths) - byte low

PPAH = High flow rate value in calibration - byte high
PPAL = High flow rate value in calibration - byte low
PPBH = Low flow rate value in calibration - byte high
PPBL = Low flow rate value in calibration - byte low
FREQCAL = Power supply Frequency of pump in calibration

5.8.3 Parameters table

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Acronym	DESCRIPTION	MODULE	Type	Byte	Range	Default	Unit	Format
SPS	Flow rate set-point from serial port	A + B	W	2	0 - 65535	0	l/h	Binary
COS	Servomotor Operating Commands Bit 0 = Calibration (only set-up) Bit 1 = Reset Parameters and board Bit 2 = Reset board	A + B	W	2	0000 ÷ FFFF	 0 0	n/a	Binary
FMPE	Motor frequency pump on duty	A + B	W	1	0 ÷ 2000	500	Hz*10	Binary
PIP	Instantaneous pump flow rate	A + B	R	2	0 - 65535	n/a	l/h	Binary
VPM	Motor position value	A + B	R	2	0 ÷ 1000	n/a	%*10	Binary
STATUS	Tool status Bit 0 = Motor speed in "Increase" (1) Bit 1 = Motor speed in "Decrease" (1) Bit 2 = Not used Bit 3 = Not used Bit 4 = Failure Alarm (1) Bit 5 = Not used Bit 6 = Duty (0) / Calibration (1) Bit 7 = Manual (0) / Automatic (1)	A + B	R	1	00 ÷ FF	 n/a n/a n/a n/a n/a n/a n/a n/a	n/a	Binary
VPA	High positon value	B	R/W	2	0 – 1000	1000	%*10	Binary
VPB	Low position value	B	R/W	2	0 – 1000	200	%*10	Binary
PPA	High pump flow rate	B	R/W	2	0 - 65535	1000	l/h	Binary
PPB	Low pump flow rate	B	R/W	2	0 - 65535	200	l/h	Binary
FMPT	Motor frequency pump in calibration	B	R/W	1	0 ÷ 2000	500	Hz*10	Binary

5.8.4 Setting up of operating controls (Acronym COS)

Bit 0 – Calibration To enter the setup calibration place at 1 bit 0 of the parameter COS. The system automatically changes the bit 6 of the parameter STATUS. The command change the functioning mode from "Flow rate control" to "Motor position control" and prepares to accept the parameters for calculating the flow rate once receiving the end of calibration command.

When the instrument is not in calibration conditions, ignores parameter data VPA, VPB, PPA, PDB and FPMT incoming communication port

Carrying out the calibration following the procedure described in "ZP actuator: On plant calibration procedure".

Write new values in the parameters VPA, VPB, PPA, PDB and FPMT. Exit the setup calibration place to zero the bit 0 of the parameter COS.

Bit 1 - Parameters & Board reset The command causes the reloading of default parameters stored in flash and resets the board. When you release the bit (ie when it is returned to zero) the command is activated.

Bit 2 - Board reset The command causes the reset of the microprocessor board. When you release the bit (ie when it is returned to zero) the command is activated.

5.9 ZP ACTUATOR: ON PLANT CALIBRATION PROCEDURE

The conditions of the plant where the pump is to be installed can vary due to physical reasons and hydraulic reasons i.e. the dimensions and the shape of the pipeline affect the pumps working conditions and also the amount of backpressure, friction loss and of course the type of fluid dosed, etc. This calibration procedure allows the pumps performance to be dimensioned with its real working conditions on the plant.

⚠ **WARNING: Should the pump motor be fitted with an inverter, the flow-rate test must be performed keeping the power frequency of the motor constant.**

- Enter the bit to start calibration (enter 1 on bit 0 in the COS parameter)

1) High value calibration

- Send the SPS value corresponding to 100% of the stroke adjustment
- Wait for the actuator to reach the position
- Read the exact value of the postion parameter VPM and enter it in the **VPA** parameter
- Measure the actual flow rate of the pump (in l/h) and enter it in the **PPA** parameter

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2) Low value calibration

- Send an SPS signal corresponding to approximately 20÷30% of the maximum rated flow rate (capacity) of the pump (check the test report of the pump, if available)
- Read the exact value of the VPM position parameter and save it in **VPB** parameter
- Measure the actual flow rate of the pump (in l/h) and enter the value in **PPB** parameter

3) Ending of the operation

- Enter the frequency value of the pumps' electric motor (FMPT)
- Enter the command to end calibration (reset bit 0 in the COS parameter)

6. HANDLING AND STORAGE

If pumps with a **Z Series** actuator are not immediately installed, they must be stored with suitable covers, in a dry, clean, vibrationless and repaired place. Pumps must be protected from the ground humidity by putting them on wooden shelves or pallets.

Do not store in –20° C areas.

Before installation leave them at ambient temperate to stabilize them at the operating temperature.

Further protection measures must be taken in case of storage in extreme conditions, such as in subtropical or desert climates.

When lifting up the actuator and the pump, fix the hooks or the ropes to the pump and not to the actuator.

If actuators are to be stored for a long period (more than 6 months), the following precautions must be adopted:

- Prior to storage: unpainted surfaces shall be protected with a long-life anticorrosion product
- Check for status approx. every six months: at first corrosion sign, clean and apply a new corrosion protection

Particular storage conditions should be previously reported, in order to foresee a suitable packaging.

7. SETTING ON DUTY

7.1 FIRST CHECKS

Work on electrical circuits or equipments must be carried out only by skilled electricians or by qualified personnel, under their supervision and control and in accordance with the applicable electrical rules.

Make sure that the supply mains match to the one on the actuator name plate. Connect the control signal cables according to the polarity (+ / -).

ATTENTION: Input resistance reading MUST BE PERFORMED when the actuator mains are connected.

7.2 ELECTRICAL CONNECTIONS AND START-UP

The use of **Z Series** electrical actuators mainly consists in connecting the supply voltage and control signal cables to the position adjuster terminals. In order to properly carry out the electrical connections it is recommended to proceed as follows:

a) Remove the terminal box cover (Pos. 279)

b) Install suitable cable glands. Separate control signal from power supply

c) Screen pilot and feedback signals cable. For PROFIBUS communication always use a shielded cable and connect the cable braid to earth so to ground the cable properly.

d) Carefully follow the instructions on the **wiring diagrams**:

- Position adjuster **Type C** **UT2952** - latest edition (see enclosure)
- Position adjuster **Type P** **UT3678** - latest edition (see enclosure)

WARNING: For ZP actuators the installer must connect the PROFIBUS cable shield earth braid correctly by means of a cable conduit with adeguate earthing or equivalent.

N.B.: ALWAYS properly ground (at least one terminal). Two grounding terminals are always available, one INSIDE on the position adjuster and one EXTERNAL on the actuator casing.

The IP66 protection degree is guaranteed by using proper cable glands ONLY correctly fitted and fastned. Unused cable entries must be sealed with adequate plugs.

- Always refer to the wiring diagram relevant to the position adjuster installed (always enclosed to the operating manual) Furthermore, inside the terminal box cover is located a sticker showing the suitable wiring diagram
- Clean and slightly grease with an acid-free product the contact surfaces of the terminal box cover (Pos. 279) and check that the gasket is in good conditions
- Reassemble terminal box cover (Pos. 279) and tightly fasten cable glands in order to guarantee the right protection degree

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7.3 OPERATING CONDITIONS

Make sure the actuator is suitable for the actual operating conditions by checking that:

a) ambient temperature is in accordance with the actuator characteristics

b) is protected from agents such as: sand, corrosive products, dust and/or fibre, water, mechanical stresses and vibrations

c) mechanical protection is foreseen: indoor installation or if outdoor, weather conditions, the combined action of temperature and humidity, and condensate must be taken into account

d) installation and running of the actuator must be carried out only according with the conditions defined in the order.

Operating conditions differing from the normal ones have always to be defined during the order phase so to avoid conditions that may jeopardize the correct running and operating safety.

7.4 NON-STANDARD STATUS

Use the actuator in the operating conditions defined in the order ONLY. Should a bad running be noted (such as a very high surface temperature, strong noise and/or vibrations) the maintenance personnel must be informed IMMEDIATELY.

OBL DECLINES ANY RESPONSIBILITY FOR DAMAGES CAUSED BY THE ACTUATOR UNPROPER AND CONTINUOUS RUNNING NOT PROMPLTY SOLVED OR REPORTED.

8. MAINTENANCE

OBL Actuators are extremely reliable, have a very good quality and they all undergo a careful final test. In case the installation has been properly carried out but a bad running holds over, DO NOT do anything but call OBL Customer Service for help.

"Self-made" maintenance operations are to be avoided. These instructions are meant to be carried out by skilled personnel ONLY.

The Safety Manager must always authorize the execution of any maintenance operations on the actuator, anyhow after having checked that:

a) the supply main has been disconnected and there are no live parts, auxiliary circuits included

b) there is no possibility of an accidental restart

c) the actuator has been properly decontaminated, should the working environment be exposed to chemical agents

Since the electric actuators are to be used in industrial areas they may need particular protection conditions, hence **further protections measures must be adopted and guaranteed by the personnel responsible for their installation.**

Any operation must be carried out with the actuator at rest and disconnected from the supply mains (including the auxiliary circuits). To allow the actuator original parts to be maintained, an efficient inspection and maintenance program must be worked out and assured by qualified technicians/personnel, taking into consideration both the operating and actual ambient conditions.

8.1 TECHNICAL DOCUMENTATION CONSULTATION

All activities must be carried out in compliance with safety rules and recommendations.

Before starting any type of work we recommend to consult carefully this operating and maintenance manual, find proper sectional drawing of actual electric actuator (see "Actuator Sectional Drawings") and gather all the instruments needed to operate correctly.

N.B.: Once the actuator has been disassembled and while waiting to be reassembled, it is better to protect the components (especially the internal parts of mechanism and paying attention to the sealing gaskets working surfaces) in order to avoid damages caused by oxidation or accidental shocks.

An incorrect installation of the sealing parts or bearings can lead to early wearing of the parts and also cause unproper running and/or overheating.

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8.2 OPERATING PRECAUTIONS

The actuator mechanism does not require lubrication and maintenance since it is greased for life. The microprocessor protects the adjusting system from accidental overloads and through the terminal box contacts, sends a remote alarm signal. Furthermore it is protected by an easily replaced fuse installed on the position adjuster.

Calibration of the electric actuator mechanism with the metering pump where it is installed is carried out by OBL during the final test phase before shipping.

Be careful not to disassemble, tamper or work directly on the internal components of the actuator! This action causes the warranty cancellation!

To synchronize the motor (Pos. 283), the adjusting rod (Pos. 291), the lead screw nut (Pos. 290), the gear reducer (Pos. 281) and the potentiometer (Pos. 282) is a delicate and difficult operation. It calls for special care, experience and the aid of specific tools used to check the correct assembly.

Should you notice a non-standard status of the actuator **DO NOT OPERATE NEITHER** directly on the above mentioned components **NOR TAMPER THEM**. Act only on the position adjuster (Pos. 295) carefully following the instructions on the enclosed trouble-shooting sheet. OBL Customer Care Service is always available for any further information and/or explanations you may need.

8.3 PERIODICAL OPERATIONS

As a general rule, after first start-up, we recommend to carry out close checks in order to work out a suitable general inspection and maintenance program.

It will be the end-user's responsibility to evaluate a preventive maintenance in case problems or irregularities are reported/indicated.

8.3.1 Checking of regular working

During periodical inspections check that:

- the actuator runs regularly and there are no strange noise and vibrations
- all safety protections have been properly installed
- there are no lubricating oil leakages

Any irregularity or non-standard status reported during the inspection phase must be solved straight away!

8.3.2 Checking of electric connections

Power supply, pilot and alarm signal and ground cables must not show wearing signs, the connections have to be tightly fastened.

8.3.3 Overall and surface cleaning

As a good rule carry out the following periodical operations:

a) prevent/remove any materials deposit on surfaces which may cause scaling

b) remove any accidental traces of corrosive agent on external surface

Should the machines be run in an environment where chemical agents are used, the equipment is exposed to corrosion and early wearing risks of sealing parts. We then recommend to periodically check that:

c) the protection covers are always installed

d) the inspection windows are always well closed

8.3.4 Checking of painting (if foreseen)

The actuator can be supplied painted (on demand), usually when it will be installed in a corrosive environment. Periodically check that painting does not show deterioration signs which can jeopardize the equipment protection degree. Repaint the machine every time it is needed.

8.4 DISASSEMBLY, REPLACEMENT AND REASSEMBLY

8.4.1 Disconnection of electrical connections

Before disassembling the actuator all electrical connections must be disconnected. Make sure that no accidental restart of the machine may occur.

8.4.2 Spare parts

Always replace any machine components with **OBL original spares.** To order spare parts refer to the nomenclature on the cross sectional drawings enclosed to this operating manual.

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Data to be always reported on order:

- type of metering pump where it is installed (complete model number)
- type of electric actuator (complete model number)
- serial number of the pump or of the actuator
- OBL job n° (as an alternative to the serial number)

N.B.: The above information are engraved on the metering pump and the electric actuator name plate.

8.4.3 Modification and manufacture of spare parts without approval

Modifications ARE NOT allowed. Original OBL spares and accessories are to be used in order to assure the conformity with safety rules . OBL declines any responsibility in case of use of non-original parts and warranty will be no longer valid.

8.4.4 Actuator reassembling

Before reassembling, carefully clean the internal parts and the components, expecially checking that the gaskets working surfaces have not been damaged. Pay attention not to damage the gaskets while assembling. Once greasing has been carried out where needed, proceed with the actuator reassembly.

8.4.5 Fuse replacement

To replace the fuse (located on the position adjuster), the following operations must be carried out:

- Remove terminal box cover (Pos. 279).
- Extract the broken/damaged fuse and replace it with a new one with same characteristics;
- Reassemble following the instructions backwards.

The actuator is now ready to work.

8.4.6 Position adjuster replacement

BEFORE replacing a position adjuster (or exchanging between two actuators) ALWAYS check that the position adjuster type, so that the calibration and the power supply values are comply with the actuators where you are installing (see "Identification code").

A correct replacement can be assured only if the internal components of the actuator have not been tampered!

To replace the position adjuster (Pos. 295), the following operations must be carried out:

- Remove the terminal box cover (Pos. 279) and disconnect all electric connections.
- Remove the housing (Pos. 277), before disassembling the manual knob (Pos. 258, if any)
- Disconnect motor internal wiring (3 wires), potentiometer (2 wires) and anticondensation heater (2 wires), if any.
- Unscrew fastening screws (Pos. 294) and remove the damaged position adjuster (Pos. 295).
- Install the new adjuster, restore the internal wiring and reassemble everything following previous instructions backwards.
- Apply voltage and adjust the flow-rate limiter trimmer (Q.max) at the requested value.

The actuator is now ready to work.

8.4.7 Personnel qualification – Customer Care

Machines revision and repair must be given only to skilled personnel who can guarantee that the equipments original conditions are restored. Further information can be obtained by contacting our Sales Department or Customer Care Department.

8.4.8 Disconnection and shipment to OBL for servicing

As a general rule we recommend to ship the whole unit (actuator and metering pump). Forwarding of the actuator alone, as lose unit, shall be evaluated from time to time on the ground of the type of irregularity, of the situation and pump type.

BEFORE shipping, always contact OBL customer service and operate as described in "Mandatory instruction for returning goods in OBL".

9. MANDATORY INSTRUCTIONS FOR RETURNING GOOD IN OBL

ATTENTION: OBL reserves the right to reject any goods received without previous notice !

We advise all customers/sender, to ALWAYS contact OBL customer service (Tel +39-02-26919.1, service@obl.it) BEFORE shipping the goods to agree whether or not servicing is necessary and convenient.

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The following instructions apply to **ANY** reason for returning goods to OBL, e.g.:

- Servicing, maintenance, upgrading, retrofitting;
- Funcional/Performance check, checking of Warranty applicability;
- BRAND NEW goods return and application for credit note due to wrong ordering;
- other…

9.1 MANDATORY INSTRUCTIONS FOR SENDER

- **BEFORE** shipping items to OBL, **ALWAYS** contact OBL customer service (+39-02-26919.1, service@obl.it) to obtain an **RA number** (OBL return goods authorisation number), information **and related forms**;
- **ALWAYS** properly clean ANY pieces of equipment from media residuals, to ensure safe working conditions for OBL's staff;
- Duly fill-in the declaration of conformity for shipping and attach it to the relevant equipment (we suggest to attach it to the shipping documents and to insert a copy in the packing);
- **PUMPS: DISASSEMBLE the pumphead and remove all parts wetted by the fluid handled, clean them and attach to the relevant pump in a separate packet. For PLUNGER pumps: remove and do not send "plunger packing", since it is highly polluted by the fluid handled;**

ATTENTION: Parts considered "hazardous" for improper cleaning will be replaced and quoted as a new spares

- Safely pack the good in a proper manner to avoid damage during transit, and clearly indicate **RA** number on packing;
- **Insert in the packing** copy of shipping documents and declaration of conformity for shipping (courier often keep them);
- **Ship goods as DDU/DDP** (always with shipping documents and indicate the relevant **RA number**) to: OBL S.rl. Via Bruno Buozzi n°1 - 20090 Segrate (MILANO) ITALY.

9.2 CLEANING OF EQUIPMENT

Take appropriate and adequate protection measures to ensure and guarantee safety at work for the operator.

In the case of machines working with chemicals product (eg acids) pay the greatest attention to the most appropriate choice of liquid to do this operation properly and safely, and also preserve the integrity of the machinery.

Present information does not replace any existing standard or requirement for safety. OBL declines any responsibility for damages to persons or property.

9.3 GOODS REJECTED TO SENDER

Should OBL receive goods:

- Not properly cleaned (and/or without declaration of conformity for shipping filled-in)
- PUMPS: With pumphead not properly dismantled and cleaned
- WITHOUT an RA number (authorisation number) on shipping documents and/or on the packing itself
- With chemicals in the packing

They WILL NOT be accepted (nor servicd) and will be sent back at sender's expenses !

10. ANNEXES

The information contained in the following documents (latest edition) are to be considered an integral part of this operating manual.

Electrical connections:

- UT2952 Position adjuster **Type C**
- UT3678 Position adjuster **Type P**

Technical specification:

- UT2953 Position adjuster **Type C**

- UT3679 Position adjuster **Type P**

Trouble shooting procedure:

- UT2954 Position adjuster **Type C**
- UT3680 Position adjuster **Type P**

11. ACTUATORS SECTIONAL DRAWINGS

The following documents (latest edition) are to be considered an integral part of this operating manual.

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- T4896 Horizontal arrangement Actuators for strokes 1, 2, 4, 6, 15 mm
- T5107 Horizontal arrangement Actuators for RH pumps type
- T4897 Vertical arrangement Actuators for strokes 15 (XL), 25, 45 mm
- T5403 Vertical arrangement Actuators for stroke 93 mm

12. CE CONFORMITY DECLARATION

Z Series electric actuators are comply to requirements of following European Directives (latest edition):

- Machinery Directive
- Low Tension Directive
- Electromagnetic Compatibility Directive

The CE conformity declaration is an integral part of this operating manual (see next page).

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POMPE DOSATRICI

METERING PUMPS

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Tel. +39 02 26919.1 – Fax +39 02 2133893 - E-mail: info@obl.it

DICHIARAZIONE DI CONFORMITÀ CE (Allegato IIB - 2006/42/CE)

CE CONFORMITY DECLARATION (Attachement IIB - 2006/42/CE)

Modello / Model / Modèle / Modell

SERVOCOMANDI ELETTRICI SERIE
ELECTRIC ACTUATORS SERIES

Z

IT DICHIARAZIONE DI CONFORMITÀ CE

Noi, **OBL s.r.l.** Via Kennedy, 12 - 20090 Segrate **MILANO - ITALIA**, dichiaramo sotto la nostra unica responsabilità che il prodotto **"Servocomando Elettrico Serie Z"** cui questa dichiarazione si riferisce, è conforme alle seguenti direttive e successive modifiche:

- **Direttiva Macchine 2006/42/CE;**
- **Direttiva Bassa Tensione 2006/95/CE;**
- **Direttiva Compatibilità Elettromagnetica 2004/108/CE.**

ATTENZIONE:

Il prodotto cui questa dichiarazione si riferisce **NON PUO'** essere messo in servizio prima che il macchinario o l'impianto in cui sarà incorporato sia stato dichiarato conforme alle disposizioni delle direttive sopra citate.

GB CE CONFORMITY DECLARATION

We, **OBL s.r.l.** Via Kennedy, 12 - 20090 Segrate **MILAN - ITALY**, declare under our sole responsibility that the product **"Z Series Electric Actuator"** relevant to this declaration complies with the following directive and subsequents modifications:

- **Machinery Directive 2006/42/EEC;**
- **Low Voltage Directive 2006/95/EEC;**
- **Electromagnetic Compatibility Directive 2004/108/EEC.**

ATTENTION:

The product relevant to this declaration **MUST NOT BE** put in service until the machinery into which they have been incorporated have been declared complies with the above mentioned directives.

FR DECLARATION DE CONFORMITE CE

Nous, **OBL s.r.l.** Via Kennedy, 12 - 20090 Segrate **MILAN - ITALIE**, déclarons sous notre seule responsabilité que le produit **"Servomoteur Électrique Séries Z"** auquel cette déclaration se rapporte, est conforme au suivantes directives et successives modifications:

- **Directive Machines 2006/42/CEE;**
- **Directive Basse Tension 2006/95/CEE;**
- **Directive Compatibilité Electromagnétique 2004/108/CEE.**

ATTENTION:

Le produit auquel cette déclaration se rapporte **NE PEUT ETRE** mis en service avant que la machine ou bien l'installation où sera incorporé ait été déclarée conforme aux dispositions des directives citées ci-dessus.

DE EU-KONFORMITÄTSERKLÄRUNG

Wir, **OBL s.r.l.** Via Kennedy, 12 - 20090 Segrate **MAILAND - ITALIEN,** erklären unter unserer Verantwortung, dass der Produkt **"Elektrischer Antrieb Z Baureihe"** auf das sich diese erklärung bezieht, den folgenden EU-richtlinien und deren anderungen entspricht:

- **Maschinenrichtlinie 2006/42/EWG;**
- **Richtlinie über die Niederspannung 2006/95/EWG;**
- **Normen über die Elektromagnetische Verträglichkeit 2004/108/EWG.**

ACHTUNG:

Dass unser produkt auf das sich diese erklärung bezieht **NICHT** in funktion treten **KANN** bevor die Maschine oder das System, in denen er eingebaut wird, entsprechend der obergenannten Richtlinien erklärt werden.

Persona autorizzata a costituire il fascicolo tecnico
Person authorized to compile the technical file
Personne autorisée à constituer le dossier technique
Person bevollmächtigt die technischen Unterlagen zusammenzustellen

Stefano COPELLI
presso / at / à / bei
OBL s.r.l. - Via Kennedy, 12 - 20090 Segrate – MILANO – ITALY

Nome e posizione del dichiarante
Name and position of issuer
Nom et fonction de l'émetteur
Name und position des Ausstellers

Dieter SAUER
President
Segrate (MILANO) ITALY: 16.07.2012

Firma del dichiarante
Signature of issuer
Signature de l'émetteur
Unterschrift des erstellers

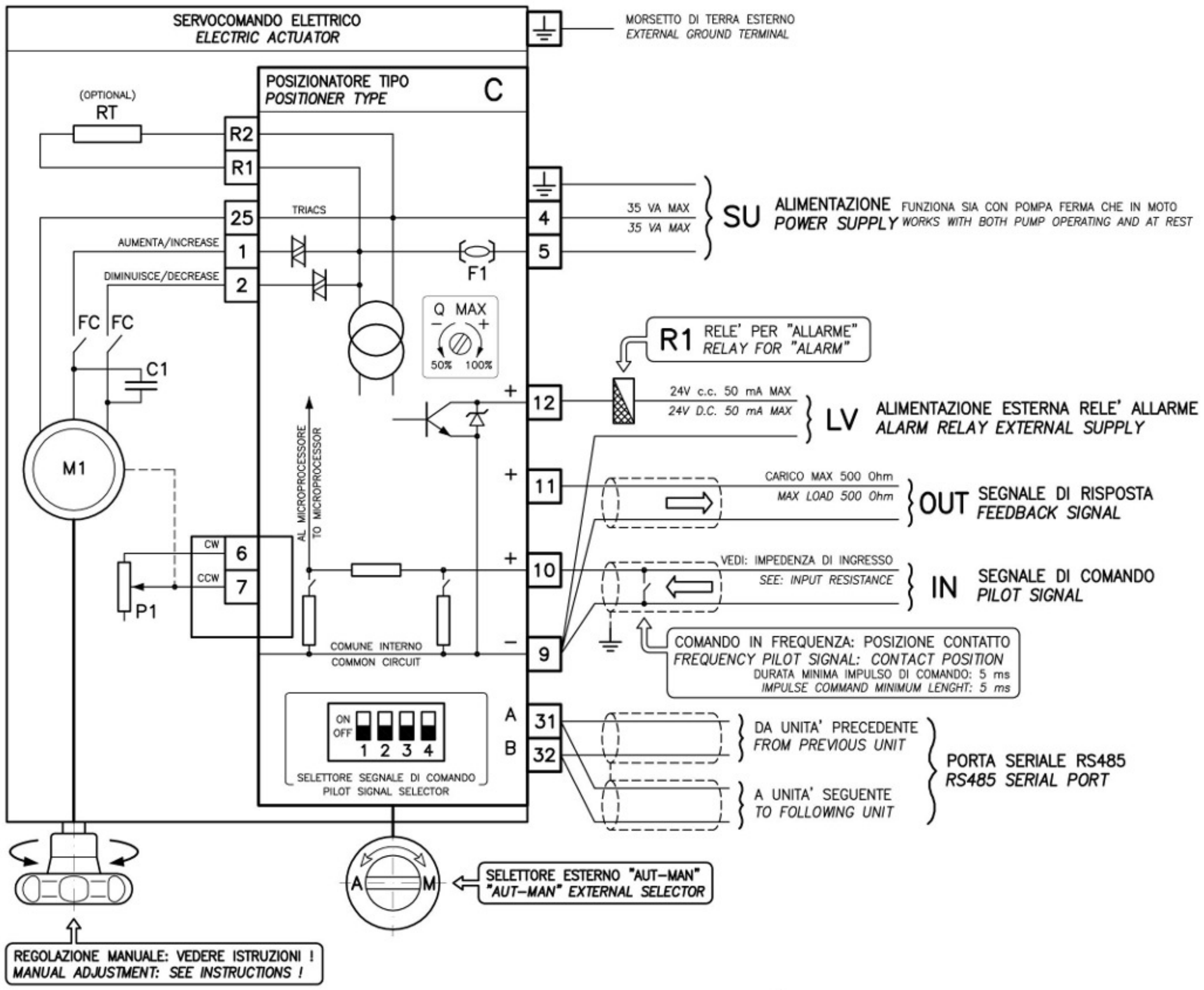
OBL	SERVOCOMANDI ELETTRICI SERIE Z *Z SERIES ELECTRIC ACTUATORS* COLLEGAMENTI REGOLATORE DI POSIZIONE TIPO "C"	TAVOLA UT2952	REV. 3 — LINGUA I/E
	"C" TYPE POSITION ADJUSTER WIRING DIAGRAM	SOSTITUISCE IL –	DATA 21.02.05

SU	ALIMENTAZIONE SERVOCOMANDO *ACTUATOR POWER SUPPLY*	230V A.C. (+10% −15%) 50/60Hz – 1PH.	115V A.C. (+10% −15%) 50/60Hz – 1PH.
M1	MOTORE BIDIREZIONALE 4 POLI *BI-DIRECTIONAL 4 POLES MOTOR*	0,012 kW	0,012 kW
C1	CONDENSATORE *CONDENSER*	1,5 µF	6,3 µF
F1	FUSIBILE (IEC257 VDE0820) *FUSE*	2A–250V (5x20) SLOW BLOW	2A–250V (5x20) SLOW BLOW
P1	POTENZIOMETRO 10 GIRI, 10 kOhm *10 TURNS, 10 kOhm POTENTIOMETER*	MOD. 7286 HELIPOT MEXICO	MOD. 7286 HELIPOT MEXICO
RT	RESISTENZA ANTICONDENSA *ANTICONDENCE HEATER*	MOD. 720958 4,7 kOhm ARCOL	MOD. 720957 2,2 kOhm ARCOL
LV	ALIMENTAZIONE ESTERNA RELE' *EXTERNAL SUPPLY RELAY*	24V c.c./D.C. MAX! 50 mA	24V c.c./D.C. MAX! 50 mA

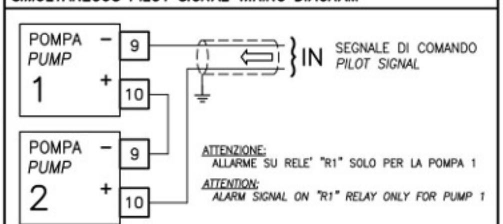
IMPOSTAZIONI *SETTINGS*	IN COMANDO *PILOT*	IMPEDENZA D'INGRESSO *INPUT RESISTANCE*	OUT RISPOSTA *FEEDBACK*
ON/OFF 1 2 3 4	4 ÷ 20 mA	124 Ohm	4 ÷ 20 mA
ON/OFF 1 2 3 4	0 ÷ 20 mA	124 Ohm	4 ÷ 20 mA
ON/OFF 1 2 3 4	20 ÷ 4 mA	124 Ohm	4 ÷ 20 mA
ON/OFF 1 2 3 4	0 ÷ 10 V	10.700 Ohm	4 ÷ 20 mA
ON/OFF 1 2 3 4	0 ÷ 2 Hz (0,2 MIN)	CONTATTO 5V; 10 mA MAX 5V CONTACT; 10 mA MAX	4 ÷ 20 mA
ON/OFF 1 2 3 4	0 ÷ 30 Hz (3,0 MIN)	CONTATTO 5V; 10 mA MAX 5V CONTACT; 10 mA MAX	4 ÷ 20 mA
ON/OFF 1 2 3 4	AZIONAMENTO MANUALE *MANUAL ADJUSTMENT*		4 ÷ 20 mA

SEGNALE DI COMANDO (SELEZIONABILE IN CAMPO):
IL REGOLATORE DI POSIZIONE PUO' RICEVERE TUTTI I SUDDETTI SEGNALI DI COMANDO, IN BASE ALL'IMPOSTAZIONE DEL SELETTORE (DIPSWITCH)
NOTA: "■" INDICA IL TASTO

PILOT SIGNAL (SELECTABLE ON FIELD):
POSITIONER ADJUSTER CAN RECEIVE ALL OF ABOVE-MENTIONED PILOT SIGNALS, ACCORDING TO SELECTOR SETTING (DIPSWITCH)
NOTE: "■" MEANS THE KEY



COLLEGAMENTO PER SEGNALE DI COMANDO SIMULTANEO
SIMULTANEOUS PILOT SIGNAL WIRING DIAGRAM



R1 RELE' PER "ALLARME" – NON FORNITO DA OBL
RELAY FOR "ALARM" – NOT SUPPLIED BY OBL

ECCITATO = CONDIZIONE NORMALE
ENERGIZED = NORMAL CONDITION

DISECCITATO= SEGNALE DI ALLARME
DE-ENERGIZED = ALARM SIGNAL

PARZIALIZZATORE DI PORTATA (Q.MAX)
FLOW RATE LIMITER (Q.MAX)

Q MAX 50% 100%

PERMETTE DI RIDURRE LA PORTATA MAX DELLA POMPA (CON SEGNALE DI COMANDO 20mA) FINO AL 50% DEL VALORE DI TARGA (VEDI MANUALE DI ESERCIZIO)

ALLOWS TO REDUCE THE PUMP MAX FLOW RATE (WITH 20mA PILOT SIGNAL) UP TO 50% OF THE PUMP RATED CAPACITY (SEE OPERATING MANUAL)

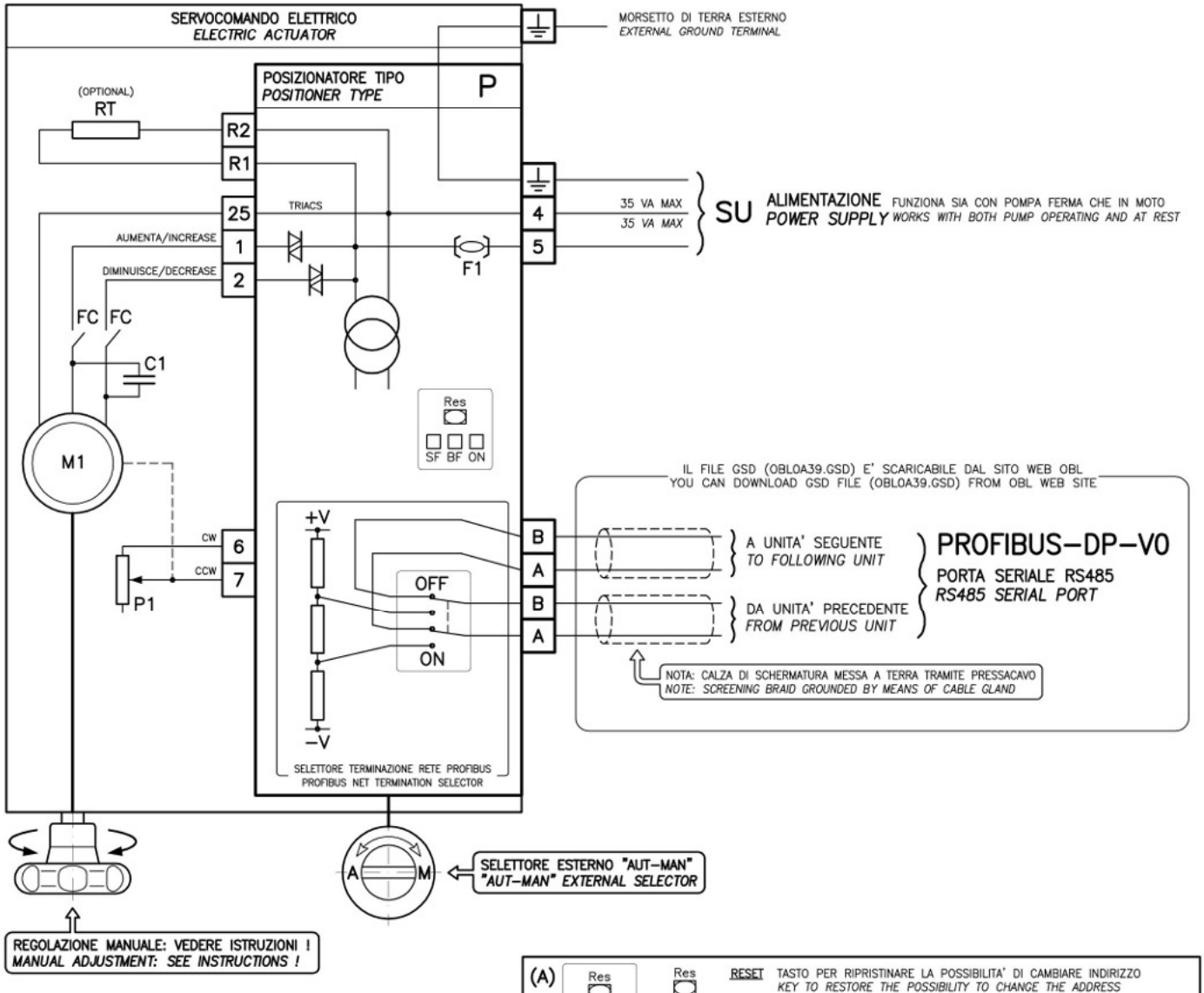
REV.	MODIFICHE	CONTR.	DATA
1	AGGIUNTO COLLEGAMENTO PER REG. SIMULTANEA		06.07.05
2	AGGIUNTI DATI PER CORSA 93		10/11/05
3	AGGIORNAMENTO GENERALE		18.06.09

DISEGNATO — CONTROLLATO — ORIGINALE IN ROSSO — DISTRIBUZIONE: DA DT GQ PR / UV UA UC PdC — LUT/PROG. –

SERVOCOMANDI ELETTRICI SERIE Z
Z SERIES ELECTRIC ACTUATORS
COLLEGAMENTI REGOLATORE DI POSIZIONE TIPO "P"
"P" TYPE POSITION ADJUSTER WIRING DIAGRAM

TAVOLA	REV.	LINGUA
UT3678	0	I/E
SOSTITUISCE IL: –	DATA: 22.03.07	
–		

SU	**ALIMENTAZIONE SERVOCOMANDO** *ACTUATOR POWER SUPPLY*	**230V A.C. (+10% −15%) 50/60Hz – 1PH.**	**115V A.C. (+10% −15%) 50/60Hz – 1PH.**
M1	MOTORE BIDIREZIONALE 4 POLI *BI-DIRECTIONAL 4 POLES MOTOR*	0,012 kW	0,012 kW
C1	CONDENSATORE *CONDENSER*	1,5 μF	6,3 μF
F1	FUSIBILE (IEC257 VDE0820) *FUSE*	2A–250V (5x20) SLOW BLOW	2A–250V (5x20) SLOW BLOW
P1	POTENZIOMETRO 10 GIRI, 10 kOhm *10 TURNS, 10 kOhm POTENTIOMETER*	MOD. 7286 HELIPOT MEXICO	MOD. 7286 HELIPOT MEXICO
RT	RESISTENZA ANTICONDENSA *ANTICONDENCE HEATER*	MOD. 720958 4,7 kOhm ARCOL	MOD. 720957 2,2 kOhm ARCOL



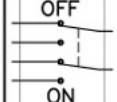
(A) Res / SF BF ON

Res — **RESET** TASTO PER RIPRISTINARE LA POSSIBILITA' DI CAMBIARE INDIRIZZO *KEY TO RESTORE THE POSSIBILITY TO CHANGE THE ADDRESS*

SF BF ON — **LEDS** SEGNALAZIONI SULLO STATO DI FUNZIONAMENTO (VEDI TABELLA) *SIGNALS ABOUT OPERATING CONDITION (SEE TABLE)*

SF ROSSO *RED*	**BF** ROSSO *RED*	**ON** VERDE *GREEN*	**SIGNIFICATO** ***MEANING***	**CAUSA** ***CAUSE***
SPENTO *LIGHT OFF*	SPENTO *LIGHT OFF*	SPENTO *LIGHT OFF*	SERVOCOMANDO SPENTO *ACTUATOR IS OFF*	MANCA TENSIONE *NO POWER*
ACCESO *LIGHT ON*	ACCESO *LIGHT ON*	ACCESO *LIGHT ON*	NESSUNA CONNESSIONE *NO CONNECTION*	BUS DISCONNESSO O MASTER NON DISPONIBILE
SPENTO *LIGHT OFF*	ACCESO *LIGHT ON*	ACCESO *LIGHT ON*	NESSUNA CONNESSIONE *NO CONNECTION*	*BUS DISCONNECTED OR MASTER NOT AVAILABLE*
ACCESO *LIGHT ON*	LAMPEGGIANTE *FLASHING*	ACCESO *LIGHT ON*	NESSUNO SCAMBIO DATI *NO DATA EXCHANGE*	CONFIGURAZIONE ERRATA O CONFIGURAZIONE MANCANTE
SPENTO *LIGHT OFF*	LAMPEGGIANTE *FLASHING*	ACCESO *LIGHT ON*	NESSUNO SCAMBIO DATI *NO DATA EXCHANGE*	*WRONG CONFIGURATION OR LACK OF CONFIGURATION*
ACCESO *LIGHT ON*	SPENTO *LIGHT OFF*	ACCESO *LIGHT ON*	SERVOCOMANDO GUASTO *ACTUATOR FAULT*	ANOMALIA AL SERVOCOMANDO *ANOMALY ON ACTUATOR*
SPENTO *LIGHT OFF*	SPENTO *LIGHT OFF*	ACCESO *LIGHT ON*	SCAMBIO DATI OK *DATA EXCHANGE OK*	CONDIZIONE NORMALE *NORMAL CONDITION*

(A) PER ULTERIORI INFORMAZIONI CONSULTARE IL SITO WEB WWW.PROFIBUS.COM
FOR OTHER INFORMATIONS CONSULT WEB SITE WWW.PROFIBUS.COM



SELETTORE TERMINAZIONE RETE PROFIBUS
PROFIBUS NET TERMINATION SELECTOR

ON POSIZIONE PER ULTIMO SERVOCOMANDO
POSITION FOR LAST ACTUATOR

OFF POSIZIONE PER SERVOCOMANDO INTERMEDIO (PASSANTE)
POSITION FOR INTERMEDIATE ACTUATOR (PASSER)

MODIFICHE | REV. | CONTR. | DATA

DISEGNATO | CONTROLLATO ORIGINALE IN ROSSO | DISTRIBUZIONE

LUT/PROG. –

OBL	**REGOLATORE DI POSIZIONE TIPO "C"** *"C" TYPE POSITION ADJUSTER* **SPECIFICA TECNICA** *TECHNICAL SPECIFICATION*	DOC./*DOC.* **UT2953**	REV. **1** / LINGUA **I/E**
		SOSTITUISCE/*REPLACE* -	DATA/*DATE* 21.02.05
		FOGLIO/*SHEET* 1	DI/*OF* 1

- Caratteristiche generali -

Alimentazione:

- 115 / 230 V c.a. (+10% - 15%) 50 / 60 Hz - 35 VA max

LED di segnalazione:

- Lampeggiante: (Lento: 1Hz) Condizione normale
(Veloce: 5Hz) Anomalia al potenziometro
- Acceso (fisso): Allarme generico

Regolazioni a fronte:

- Selettore per il segnale di comando (Dipswitch)
- Parzializzatore portata (Q. Max): 50÷100% portata max pompa

Sistema di sicurezza:

- Protezione da blocco meccanico della pompa

Banda morta di regolazione:

- 2% del fondoscala (non modificabile)

Misura posizione motore:

- Potenziometro 10.000 Ohm - 10 giri
- Precisione 0,5% del fondoscala

Comando motore:

- TRIAC optoisolati

Collegamenti:

- A morsettiera per filo da 2,5 mmq max.

Fusibile:

- 2A-250V (5x20) SLOW BLOW

Numero di modello:

- C1 = alimentazione 115 V c.a.
- C2 = alimentazione 230 V c.a.

- Segnali di ingresso -

Segnale di comando (selezionabile in campo):

NB: Il regolatore di posizione può ricevere **tutti** i seguenti segnali di comando, in base all'impostazione del selettore (Dipswitch).

- 4 ÷ 20 mA c.c su 124 Ohm
- 0 ÷ 20 mA c.c su 124 Ohm
- 20 ÷ 4 mA c.c su 124 Ohm
- 0 ÷ 10 V c.c su 10.700 Ohm
- 0 ÷ 2 Hz (0,2 min) - contatto 5 V - 10 mA max. (1)
- 0 ÷ 30 Hz (3,0 min) - contatto 5 V - 10 mA max. (1)

Nota (1) Durata minima impulso di comando: 5 ms. Tramite la linea seriale RS-485 il fondoscala di entrambi i segnali di comando in frequenza può essere impostato da 2 a 50 Hz.

Porta seriale:

- Protocollo RS-485

- Segnali di uscita -

Segnale di risposta:

- 4 ÷ 20 mA c.c su 750 Ohm max.

Segnale di "Allarme guasto":

- Transistor NPN a collettore aperto per comando relè esterno. Tensione max. 24 V c.c. - Corrente max. 50 mA

  Transistor chiuso: Condizione normale

  Transistor aperto: Blocco microprocessore (watch dog), motore bloccato oltre 10 sec.

- Numero di modello -

Numero di modello:		**C**	**n**
Alimentazione:	115 V		1
	230 V		2

- General data -

Power supply:

- *115 / 230 V A.C. (+10% - 15%) 50 / 60 Hz - 35 VA max*

Signalization LED:

- *Flashing:* *(Slow: 1Hz) Normal condition*
(Fast: 5Hz) Anomaly at potentiometer
- *Light on (fixed):* *Generic alarm*

Front adjustment:

- *Pilot signal selector (Dipswitch)*
- *Flow rate limiter (Q. Max): 50÷100% of pump max flow rate*

Safety system:

- *Protection against pump mechanical block*

Adjustment dead band:

- *2% full scale (not changeable)*

Motor position misure:

- *10.000 Ohm potentiometer - 10 turns*
- *Precision 0,5% full scale*

Motor drive:

- *TRIAC opto-isolated*

Terminal board:

- *Terminal board for 2,5 mmq max. cable*

Fuse:

- *2A-250V (5x20) SLOW BLOW*

Model number:

- *C1 = 115 V a.c. power supply*
- *C2 = 230 V a.c. power supply*

- Input signals -

Pilot signal (selectable on field):

NB: *Positioner adjuster can receive **all** among following pilot signals, according to selector setting (Dipswitch).*

- *4 ÷ 20 mA d.c on 124 Ohm*
- *0 ÷ 20 mA d.c on 124 Ohm*
- *20 ÷ 4 mA d.c on 124 Ohm*
- *0 ÷ 10 V d.c on 10.700 Ohm*
- *0 ÷2 Hz (0,2 min) - 5 V contact - 10 mA max.* (1)
- *0 ÷ 30 Hz (3,0 min) - 5 V contact - 10 mA max.* (1)

Note (1) *Impulse command minimum lenght: 5 ms. By means of RS-485 serial line both full scale of frequency pilot signals can be set from 2 to 50 Hz.*

Serial port:

- *RS-485 protocol*

- Output signals -

Feedback signal:

- *4 ÷ 20 mA d.c. on 750 Ohm max.*

"Failure alarm" signal:

- *Open collector NPN transistor to drive external relay. Max. voltage 24 V d.c. - max. corrent 50 mA*

  Transistor close: *Normal condition*

  Transistor open: *Microprocessor locked (watch dog), motor locked over 10 sec.*

- Model number -

Model number:		***C***	***n***
Power supply:	*115 V*		*1*
	230 V		*2*

REV.	MODIFICHE	CONTR.	DATA
1	AGGIORNAMENTO GENERALE	V.D.	18.06.09

DISEGNATO	CONTROLLATO	DISTRIBUZIONE	
E. SERRAINO	V. D'ADDIO (ORIGINALE IN ROSSO)	DA / DT / GQ / PR	UV / UA / UC / PdC X

LUT/PROG.

REGOLATORE DI POSIZIONE TIPO "P"

"P" TYPE POSITION ADJUSTER

SPECIFICA TECNICA

TECHNICAL SPECIFICATION

DOC./*DOC.*	REV.	LINGUA
UT3679	0	I/E
SOSTITUISCE/*REPLACE*	DATA/*DATE*	
-	22.03.07	
FOGLIO/*SHEET*	DI/*OF*	
1	1	

- Caratteristiche generali -

Alimentazione:
- 115 / 230 V c.a. (+10% - 15%) 50 / 60 Hz - 35 VA max

LED di segnalazione:
- Vedi tabella "Legenda segnalazioni led" di seguito

Regolazioni a fronte:
- Selettore terminazione rete PROFIBUS
- Tasto "Res" per cambiare l'indirizzo del servocomando

Sistema di sicurezza:
- Protezione da blocco meccanico della pompa

Banda morta di regolazione:
- 2% del fondoscala (non modificabile)

Misura posizione motore:
- Potenziometro 10.000 Ohm - 10 giri
- Precisione 0,5% del fondoscala

Comando motore:
- TRIAC optoisolati

Collegamenti:
- A morsettiera per filo da 2,5 mmq max.

Fusibile:
- 2A-250V (5x20) SLOW BLOW

Numero di modello:
- P1 = alimentazione 115 V c.a.
- P2 = alimentazione 230 V c.a.

- Segnali di ingresso e uscita -

Protocollo di comunicazione:
- Profibus DP-V0 (File GSD: OBL0A39.GSD)

  Nota: Il file GSD è scaricabile dal sito web OBL

Tecnologia di trasmissione:
- Porta seriale RS485

- Numero di modello -

Numero di modello:		**P**	**n**
Alimentazione:	115 V		1
	230 V		2

- Legenda segnalazioni Led -

- General data -

Power supply:
- *115 / 230 V A.C. (+10% - 15%) 50 / 60 Hz - 35 VA max*

Signalization LED:
- *See table "Led signals key" on the bottom*

Front adjustment:
- *PROFIBUS net termination selector*
- *"Res" key to change the actuator address*

Safety system:
- *Protection against pump mechanical block*

Adjustment dead band:
- *2% full scale (not changeable)*

Motor position misure:
- *10.000 Ohm potentiometer - 10 turns*
- *Precision 0,5% full scale*

Motor drive:
- *TRIAC opto-isolated*

Terminal board:
- *Terminal board for 2,5 mmq max. cable*

Fuse:
- *2A-250V (5x20) SLOW BLOW*

Model number:
- *P1 = 115 V a.c. power supply*
- *P2 = 230 V a.c. power supply*

- Input & output signals -

Communication protocol:
- *Profibus DP-V0 (File GSD: OBL0A39.GSD)*

  Note: You can download GDS file from OBL web site

Transmission technology:
- *RS485 serial port*

- Model number -

Model number:		***P***	***n***
Power supply:	*115 V*		*1*
	230 V		*2*

- Led signals key -

SF (rosso) *(red)*	**LED BF** (rosso) *(red)*	**ON** (verde) *(green)*	**SIGNIFICATO** ***MEANING***	**CAUSA** **CAUSE**
Spento *Off*	Spento *Off*	Spento *Off*	Servocomando spento *Actuator is off*	Manca tensione *No power*
Acceso *On*	Acceso *On*	Acceso *On*	Nessuna connessione *No connection*	Bus disconnesso o Master non disponibile *Bus disconnected or Master not available*
Spento *Off*	Acceso *On*	Acceso *On*	Nessuna connessione *No connection*	Bus disconnesso o Master non disponibile *Bus disconnected or Master not available*
Acceso *On*	Lampeggiante *Flashing*	Acceso *On*	Nessuno scambio dati *No data exchange*	Configurazione errata o mancante *Wrong configuration or lack of configuration*
Spento *Off*	Lampeggiante *Flashing*	Acceso *On*	Nessuno scambio dati *No data exchange*	Configurazione errata o mancante *Wrong configuration or lack of configuration*
Acceso *On*	Spento *Off*	Acceso *On*	Servocomando guasto *Actuator fault*	Anomalia al servocomando *Anomaly on actuator*
Spento *Off*	Spento *Off*	Spento *Off*	Scambio dati OK Data exchange OK	Condizione normale Normal condition

Informazioni dettagliate su "PROFIBUS Profile Guidelines: Part 3 Diagnosis and Alarms" o sito www.profibus.com
Detailed informations on "PROFIBUS Profile Guidelines: Part 3 Diagnosis and Alarms" or www.profibus.com site

DISEGNATO E. SERRAINO — CONTROLLATO V. D'ADDIO — ORIGINALE IN ROSSO — DISTRIBUZIONE: DA UV, DT UA, GQ UC, PR PdC X — LUT/PROG. — MODIFICHE — REV. — CONTR. — DATA

REGOLATORI DI POSIZIONE: TIPO "E" - TIPO "C"

POSITION ADJUSTERS: "E" TYPE - "C" TYPE

PROCEDURA RICERCA GUASTI

TROUBLE SHOOTING PROCEDURE

DOC./*DOC.*	REV.	LINGUA
UT2954	0	I/E
SOSTITUISCE/*REPLACE*	DATA/*DATE*	
-	21.02.05	
FOGLIO/*SHEET*	DI/*OF*	
1	1	

DISFUNZIONE *TROUBLE*	VERIFICA *CHECK*	?	SOLUZIONE *SOLUTION*
Il relè esterno segnala allarme. Il servocomando funziona regolarmente ***Alarm signal from external relay.*** ***Actuator works in order***	L'alimentatore del relè esterno di allarme è acceso? ***Is the external relay power supplier switched-on?***	SI ***YES***	Verificare integrità relè esterno ed alimentatore ***Check external relay and power supplier status***
		NO ***NO***	Accendere l'alimentatore del relè esterno ***Switch-on the external relay power supplier***
Il relè esterno segnala allarme. Il led sul regolatore di posizione è spento ***Alarm signal from external relay.*** ***Position adjuster led switched-off***	Il regolatore di posizione e' alimentato? ***Is the position adjuster fed?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Dare tensione al regolatore di posizione ***Apply voltage to position adjuster***
	C'è tensione ai morsetti 4-5 di alimentazione? ***Is there voltage between supply terminals 4-5?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Sostituire il fusibile F1 se bruciato ***Replace the F1 fuse if burnt***
I motore del servocomando non si muove. Il led sul regolatore di posizione lampeggia ***Actuator motor does not run.*** ***Position adjuster led is flashing***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***
	C'è tensione tra i morsetti 25-1 e 25-2? (110 o 220 V c.a.) ***Is there voltage between terminals 25-1 and 25-2? (110 or 220 V A.C.)***	SI ***YES***	Sostituire il motore del servocomando ***Replace the actuator motor***
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
Il motore del servocomando si muove solo in aumento. Il led sul regolatore di posizione lampeggia ***Actuator motor increase only.*** ***Position adjuster led is flashing***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***
	Inviare un segnale di comando inferiore alla posizione attuale. C'è tensione tra i morsetti 25-2? ***Send pilot signal lower than present position.*** ***Is there voltage between terminals 25-2?***	SI ***YES***	Sostituire il motore del servocomando ***Replace the actuator motor***
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
Il motore del servocomando si muove solo in diminuzione. Il led sul regolatore di posizione lampeggia ***Actuator motor decrease only.*** ***Position adjuster led is flashing***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***
	Inviare un segnale di comando superiore alla posizione attuale. C'è tensione tra i morsetti 25-1? ***Send pilot signal higher than present position.*** ***Is there voltage between terminals 25-1?***	SI ***YES***	Sostituire il motore del servocomando *Replace the actuator motor*
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
Il motore del servocomando si ferma in posizione non corrispondente al segnale di comando ricevuto. La pompa è in marcia ***Actuator motor stops in a position not matching pilot signal.*** ***Pump is running***	Inviare il segnale di comando pari al 100%. L'indicatore della portata della pompa si posiziona al 100% ±2%? ***Send pilot signal to reach 100%.*** ***Does the pump flowrate indicator set to 100% ±2%?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Verificare che il servocomando si muova liberamente con il comando manuale ***Check if actuator is free to move by adjusting it manually***
		NO ***NO***	Ripetere la procedura di taratura iniziale (vedi: Sostituzione regolatore di posizione) ***Repeat initial setting procedure (see: Position adjuster replacement)***
Il segnale di risposta è mancante ***No feedback signal***	C'è tensione tra i morsetti 9-11? ***Is there voltage between terminals 11-9?***	SI ***YES***	Verificare le connessioni allo strumento ricevente o la sua integrità ***Check connections to receiving instrument or its proper working status***
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
Il segnale di risposta non è uguale al segnale di comando moltiplicato per il valore del Q.max ***Feedback ≠ pilot signal X Q.max setting***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***

DISEGNATO E. SERRAINO | CONTROLLATO V. D'ADDIO (ORIGINALE IN ROSSO) | DISTRIBUZIONE DA UV, DT UA, GQ UC, PR PdC X | MODIFICHE REV. CONTR. DATA

REGOLATORE DI POSIZIONE TIPO "P"

"P" TYPE POSITION ADJUSTER

PROCEDURA RICERCA GUASTI

TROUBLE SHOOTING PROCEDURE

DOC./*DOC.*	REV.	LINGUA
UT3680	0	I/E
SOSTITUISCE/*REPLACE*	DATA/*DATE*	
-	22.03.07	
FOGLIO/*SHEET* 1	DI/*OF* 1	

DISFUNZIONE *TROUBLE*	VERIFICA *CHECK*	?	SOLUZIONE *SOLUTION*
La comunicazione è interrotta ***Communication break off***	Il servocomando è alimentato? ***Is the actuator fed?***	SI ***YES***	Verificare la rete Profibus ***Check Profibus net***
		SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Dare tensione al servocomando ***Apply voltage to actuator***
I motore del servocomando non si muove. ***Actuator motor does not run.***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***
	C'è tensione tra i morsetti 25-1 e 25-2? (110 o 220 V c.a.) ***Is there voltage between terminals 25-1 and 25-2? (110 or 220 V A.C.)***	SI ***YES***	Sostituire il motore del servocomando ***Replace the actuator motor***
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
Il motore del servocomando si muove solo in aumento. ***Actuator motor increase only.***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***
	Inviare un segnale di comando inferiore alla posizione attuale. C'è tensione tra i morsetti 25-2? ***Send pilot signal lower than present position. Is there voltage between terminals 25-2?***	SI ***YES***	Sostituire il motore del servocomando ***Replace the actuator motor***
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
Il motore del servocomando si muove solo in diminuzione. ***Actuator motor decrease only.***	La pompa è in marcia? ***Is the pump running?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Avviare la pompa ***Switch-on the pump***
	Inviare un segnale di comando superiore alla posizione attuale. C'è tensione tra i morsetti 25-1? ***Send pilot signal higher than present position. Is there voltage between terminals 25-1?***	SI ***YES***	Sostituire il motore del servocomando *Replace the actuator motor*
		NO ***NO***	Sostituire il regolatore di posizione ***Replace the position adjuster***
La regolazione si ferma in posizione non corretta rispetto al segnale di comando ricevuto. La pompa è in marcia ***Adjustment stops in a position not matching pilot signal. Pump is running***	Inviare il segnale di comando pari al 100%. L'indicatore della regolazione si posiziona al 100% ±2%? ***Send pilot signal to reach 100%. Does the adjustment indicator set to 100% ±2%?***	SI ***YES***	Sostituire il regolatore di posizione ***Replace the position adjuster***
		NO ***NO***	Verificare il libero movimento con comando manuale ***Verify free movement by manual adjustment***
		NO ***NO***	Ripetere la procedura di taratura iniziale (vedi: Sostituzione regolatore di posizione) ***Repeat initial setting procedure (see: Position adjuster replacement)***

Cablaggio e avvio PROFIBUS: Errori più frequenti	*PROFIBUS wiring and start-up: Most common mistakes*
Linea del segnale: - Cortocircuito tra linea A, linea B o schermatura - Linea A e linea B scambiate o incrociate - Linea A, linea B o schermatura interrotti	***Signal line:*** *- Short-circuit between line A, line B or screening* *- Line A and line B mis-wired or cross-wired* *- Line A, line B or screening cut out*
Terminazione bus: - Un'estremità del segmento del bus non ha una terminazione - Due o più resistori del terminale bus sono accesi - Il resistore del terminale bus non è alimentato - Nessun resistore del terminale bus dopo un ripetitore senza slave	***Bus terminal:*** *- Bus edge with no terminal* *- Two or more resistors of the bus terminal are switched on* *- Resistor of bus terminal is not powered* *- No resistor of the bus terminal after a repeater with no slave*
Cavo PROFIBUS: - Cavo bus installato troppo lungo o velocità di trasmissione troppo alta - Tipo di cavo installato errato (non è un cavo PROFIBUS) - Sono stati installati cavi di produttori differenti - Le linee di derivazione sono troppo lunghe - La lunghezza minima del cavo tra i dispositivi (1 metro) non è rispettata	***PROFIBUS cable:*** *- Bus cable too long or transmission velocity too high* *- Wrong type of cable being installed (it is not a PROFIBUS cable)* *- Cables from different manufacturers are being installed* *- Shunt lines are too long* *- Minimum distance cable between each device (1 metre) not respected*
Ambiente elettrico: - Nessun conduttore di collegamento equipotenziale o quantità insufficiente - Livello di segnale insufficiente sulla linea RS485 - Problemi di interferenza elettromagnetica: • Accoppiamento capacitivo e/o presenza di scariche • Correnti di dispersione sui cavi schermati • Sorgenti potenziali di interferenze (es. inverter, contattori, motori, ecc.) • Cavo PROFIBUS troppo vicino a sorgenti potenziali di interferenze - Struttura di alimentazione errata - Struttura di messa a terra inadatta - Cavo schermato non messo a terra ad entrambe le estremità. La messa a terra non copre un'area sufficientemente grande	***Electric environment:*** *- No unipotential wiring conductor or not enough quantity* *- Low level signal on RS485 line* *- Problems due to electromagnetic interference:* • *Capacity coupling and/or disturbances* • *Current leakage along shielded cables* • *Possible sources of interference (e.g.. inverter, contactor, motor, et.)* • *PROFIBUS cable to close to a possible sources of interference* *- Wrong power frame* *- Unsuitable earthing* *- Unearthed shielded cable to either ends. Earthing does not cover sufficient area.*
Impostazioni del bus: - Nessun master nel sistema - L'opzione del bus non è impostata a "ON" - E' stato impostato l'indirizzo bus errato - Indirizzo bus assegnato più di una volta - E' stato impostato il baud rate errato per il master - Troppi dispositivi (più di 32) in un singolo segmento del bus	***Bus settings:*** *- No Master in the system* *- Bus option not set to "ON"* *- Wrong bus address being set* *- Bus address multi-allocation* *- A wrong baud rate for the master has been set* *- Too many devices (more than 32) in a single bus element*

Per informazioni aggiuntive fare riferimento alle linee guida per l'installazione PROFIBUS o consultare il sito www.profibus.com

For additional informations refers to PROFIBUS installation guidelines or consult www.profibus.com site

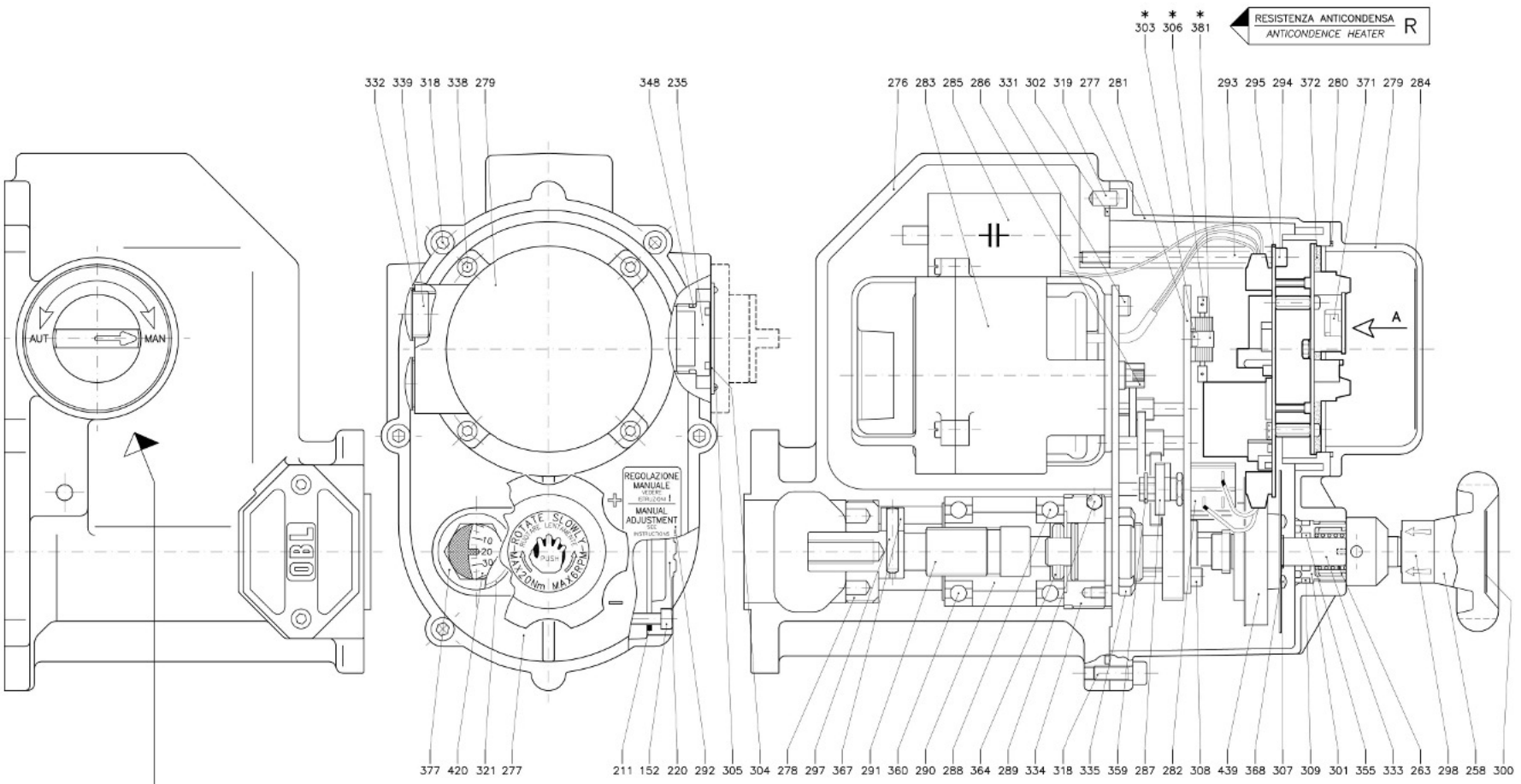
DISEGNATO E. SERRAINO | CONTROLLATO V. D'ADDIO | ORDINALE IN ROSSO | DISTRIBUZIONE PR PdC GQ UC DT UA DA UV | LUT/PROG. | DATA | CONTR. | MODIFICHE | REV.

SERVOCOMANDO ELETTRICO TIPO "Z" REGOLATORE DI POSIZIONE CON MICROPROCESSORE	TAVOLA 4896	REV. 3	LINGUA I/E
	SOSTITUISCE IL –	DATA 23/06/04	
VALIDO PER CORSE 1, 2, 4, 6, 15 mm	*SECTIONAL DRAWING*		*"Z" TYPE ELECTRIC ADJUSTER* *MICROPROCESSOR POSITION ADJUSTER* *1, 2, 4, 6, 15 mm STROKES ONLY*

REV.	MODIFICHE	CONTR.	DATA
1	AGGIUNTA POS. 332		30/01/07
2	AGGIUNTA POS. 235, 348. SELETTORE "AUT–MAN" T.5854		20/05/08
3	AGGIORNATA		05/02/09

DISEGNATO D. LISCO — CONTROLLATO ORIGINALE IN ROSSO — DISTRIBUZIONE

LIT/PROD. ST-154

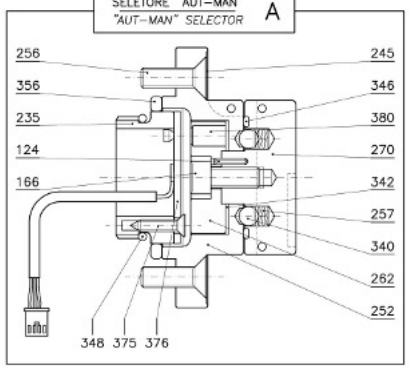


RESISTENZA ANTICONDENSA / *ANTICONDENCE HEATER* R

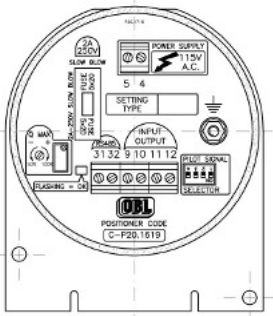
INTERVENTO MANUALE DI EMERGENZA / *EMERGENCY MANUAL ADJUSTMENT* STD

OPTIONAL *

SELETORE "AUT–MAN" / *"AUT–MAN" SELECTOR* A

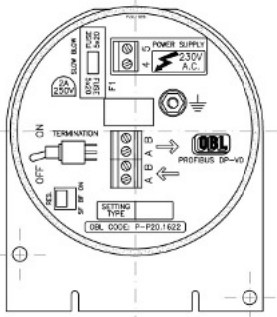


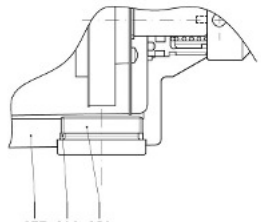
REGOLATORE DI POSIZIONE / *ADJUSTMENT POSITIONER* C



VISTA "A" / *"A" VIEW*

REGOLATORE DI POSIZIONE / *ADJUSTMENT POSITIONER* P





POS.277 CARTER IN ALLUMINIO / *POS.277 ALUMINIUM CARTER* L

* OPTIONAL

POS ITEM	COMPONENTI MECCANISMO / *MECHANISM COMPONENTS*	
124	SPINA ELASTICA MANOPOLA	*KNOB ELASTIC PIN*
152	VITE FISS. COPERCHIO	*COVER LOCK. SCREW*
166	VITE FISS. MANOPOLA	*KNOB LOCK. SCREW*
211	GUARNIZIONE COPERCHIO	*COVER GASKET*
220	COPERCHIO	*COVER*
235	TAPPO/PORTASENSORE	*PLUG/SENSOR SUPPORT*
245	ADESIVO "AUT–MAN"	*"AUT–MAN" STICKER*
252	CORPO SELETTORE	*SELECTOR BODY*
256	VITE FISS. CORPO SELETTORE	*SELECT. BODY LOCK. SCREW*
257	MOLLA	*SPRING*
258	MANOPOLA	*SETTING KNOB*
259	TAPPO	*PLUG*
262	PORTAMAGNETE	*MAGNET HOUSING*
263	MOLLA MANOPOLA	*SETTING KNOB SPRING*
270	MANOPOLA SELETTORE	*SELECTOR KNOB*
276	CORPO	*HOUSING*
277	CARTER	*CARTER*
278	GHIERA	*RING NUT*
279	COPERCHIO MORSETTIERA	*TERMINAL BOARD COVER*
280	O–RING COPERCHIO	*COVER O–RING*
281	GRUPPO RIDUTTORE	*GEAR REDUCTION UNIT*
282	POTENZIOMETRO	*POTENTIOMETER*
283	MOTORE	*MOTOR*
284	SCHEMA ELETTRICO ADESIVO	*ADHESIVE WIRING DIAGRAM*
285	CONDENSATORE	*CONDENSER*
286	PIGNONE	*PINION*
287	INGRANAGGIO POTENZIOMETRO	*POTENTIOMETER GEAR WHEEL*
288	CUSCINETTO MADREVITE	*NUT SCREW BALL BEARING*
289	SFERA DI FRIZIONE	*FRICTION BALL*
290	MADREVITE	*NUT SCREW*
291	VITE REGOLAZIONE	*ADJUSTMENT SCREW*
292	ETICHETTA AVVISO REGOLAZIONE	*ADJUSTMENT WARNING LABEL*
293	DISTANZIALE REGOLATORE	*POSITION ADJ. SPACER*
294	VITE FISS. REGOLATORE	*POSITION ADJ. LOCK. SCREW*
295	REGOLATORE DI POSIZIONE	*POSITION ADJUSTER*
296	OR TAPPO	*PLUG O–RING*
297	SPINA ANTIGIRO	*ANTIREVOLUTION PIN*
298	ETICHETTA CORPO MANOPOLA	*KNOB BODY LABEL*
300	ETICHETTA MANOPOLA	*KNOB LABEL*
301	GHIERA CARTER	*CARTER RING NUT*
302	OR CORPO RIDUTTORE	*REDUCTION HOUSING O–RING*
303	VITE FISS. STAFFA	*BRACKET LOCK. SCREW*
304	TARGHETTA DATI	*NAMEPLATE*
305	RIVETTO TARGHETTA	*NAMEPLATE RIVET*
306	RESISTENZA ANTICONDENSA	*ANTICONDENCE HEATER*
307	VITE FISS. NONIO	*NONIUS LOCK. SCREW*
308	VITE FISS. RIDUTTORE	*REDUCT. UNIT LOCK. SCREW*
309	OR GHIERA CARTER	*CARTER RING NUT O–RING*
318	VITE FISS. CORPO	*HOUSING LOCK. SCREW*
319	SPINA CORPO	*HOUSING PIN*
321	OR TAPPO LETTURA	*READING PLUG O–RING*
331	VITE FISS. MOTORE	*MOTOR LOCK. SCREW*
332	OR TAPPO	*PLUG O–RING*
333	ALBERO DI MANOVRA	*OPERATION SHAFT*
334	GHIERA FISS. RIDUTTORE	*REDUCT. UNIT LOCK. RING NUT*
335	GHIERA RIDUTTORE	*GEAR REDUCT. RING NUT*
338	VITE FISS. COP. MORSETTIERA	*COVER LOCK. SCREW*
339	TAPPO FORO PRESSACAVO	*CABLE GLAND HOLE CAP*
340	SFERA	*SPHERE*
342	DISTANZIALE	*SPACER*
346	OR MANOPOLA	*KNOB O–RING*
348	OR TAPPO/PORTASENSORE	*PLUG/SENSOR O–RING*
355	OR ALBERO DI MANOVRA	*OPERATION SHAFT O–RING*
356	OR CORPO SELETTORE	*SELECTOR BODY O–RING*
359	SEEGER	*SEEGER*
360	CUSCINETTO MADREVITE	*NUT SCREW BALL BEARING*
364	SPINA RIDUTTORE	*GEAR REDUCT. PIN*
367	CUSCINETTO ANTIGIRO	*ANTIREVOLUTION BALL BEARING*
368	SEEGER ALBERO DI MANOVRA	*OPERATION SHAFT SEEGER*
371	FUSIBILE	*FUSE*
372	GUARNIZIONE	*GASKET*
375	VITE FISS. SENSORE	*SENSOR LOCK. SCREW*
376	SENSORE	*SENSOR*
377	SPIA DI LETTURA	*READING WINDOW*
380	MAGNETE	*MAGNET*
381	STAFFA FISS. RESISTENZA	*HEATER LOCK. BRACKET*
420	NONIO	*VERNIER*
439	PORTA NONIO	*HOUSING VERNIER*

REV.	MODIFICHE	CONTR.	DATA
1	AGGIUNTA POS. 332		30/01/07
2	AGGIUNTA POS. 235, 348, SELETTORE "AUT-MAN" T.5854		20/05/08
3	AGGIORNATA		05/02/09

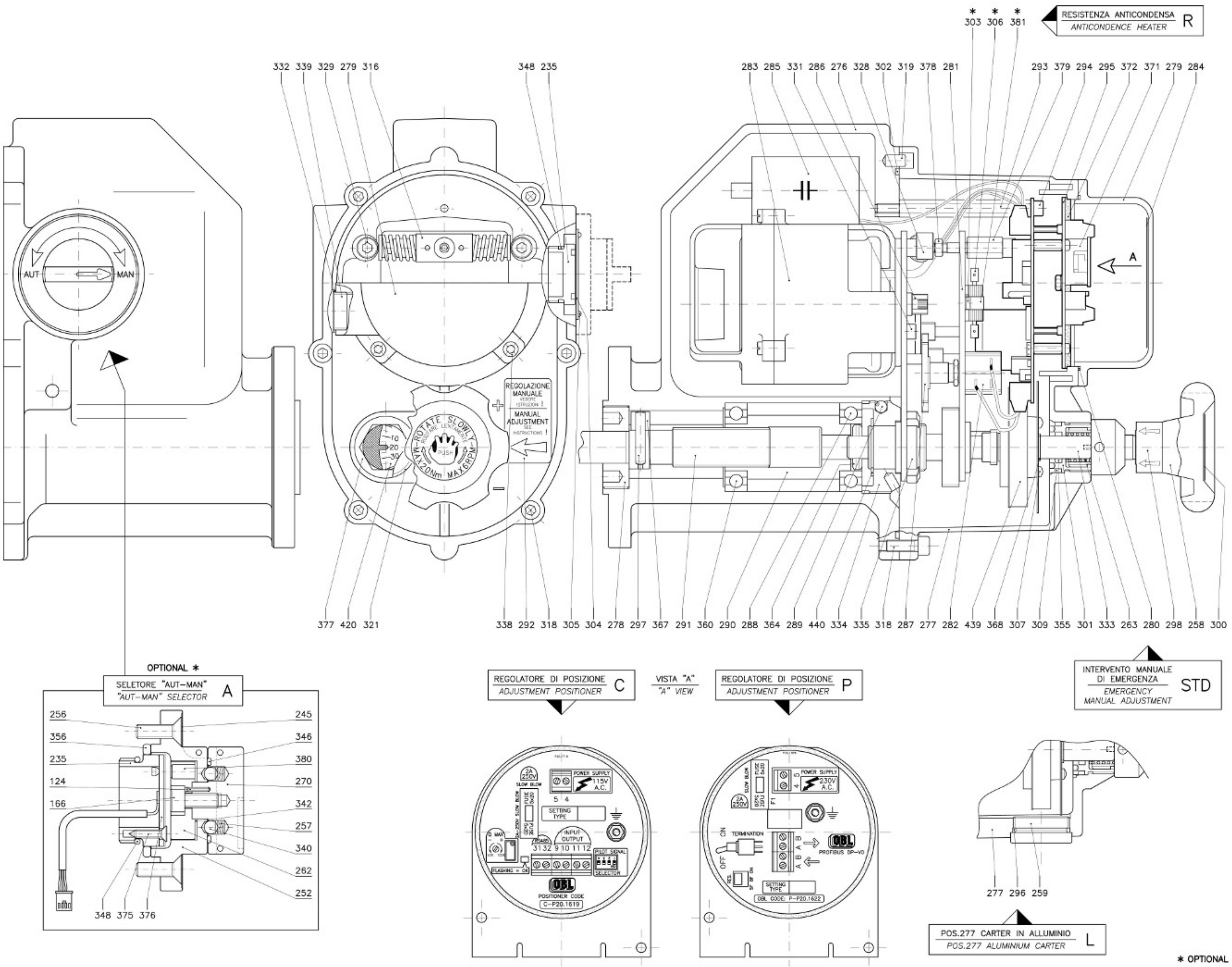
DISEGNATO: D. LISCO — CONTROLLATO — ORIGINALE IN ROSSO — DISTRIBUZIONE: DA DT GQ PR UV UA UC PdC

SERVOCOMANDO ELETTRICO TIPO "Z"
REGOLATORE DI POSIZIONE CON MICROPROCESSORE
VALIDO PER POMPA TIPO "RH"

TAVOLA 5107 — REV. 3 — LINGUA I/E — SOSTITUISCE IL – — DATA 18/11/04

SECTIONAL DRAWING

"Z" TYPE ELECTRIC ADJUSTER
MICROPROCESSOR POSITION ADJUSTER
FOR "RH" PUMP TYPE ONLY



* OPTIONAL

POS ITEM	COMPONENTI MECCANISMO	MECHANISM COMPONENTS
124	SPINA ELASTICA MANOPOLA	KNOB ELASTIC PIN
166	VITE FISS. MANOPOLA	KNOB LOCK. SCREW
235	TAPPO/PORTASENSORE	PLUG/SENSOR SUPPORT
245	ADESIVO "AUT-MAN"	"AUT-MAN" STICKER
252	CORPO SELETTORE	SELECTOR BODY
256	VITE FISSAGGIO GHIERA	RING NUT LOCKING SCREW
257	MOLLA	SPRING
258	MANOPOLA	SETTING KNOB
259	TAPPO	PLUG
262	PORTAMAGNETE	MAGNET HOUSING
263	MOLLA MANOPOLA	SETTING KNOB SPRING
270	MANOPOLA SELETTORE	SELECTOR KNOB
276	CORPO	HOUSING
277	CARTER	CARTER
278	GHIERA	RING NUT
279	COPERCHIO MORSETTIERA	TERMINAL BOARD COVER
280	O-RING COPERCHIO	COVER O-RING
281	GRUPPO RIDUTTORE	GEAR REDUCTION UNIT
282	POTENZIOMETRO	POTENTIOMETER
283	MOTORE	MOTOR
284	SCHEMA ELETTRICO ADESIVO	ADHESIVE WIRING DIAGRAM
285	CONDENSATORE	CONDENSER
286	PIGNONE	PINION
287	INGRANAGGIO POTENZIOMETRO	POTENTIOMETER GEAR WHEEL
288	CUSCINETTO MADREVITE	NUT SCREW BALL BEARING
289	SFERA DI FRIZIONE	FRICTION BALL
290	MADREVITE	NUT SCREW
291	VITE REGOLAZIONE	ADJUSTMENT SCREW
292	ETICHETTA AVVISO REGOLAZIONE	ADJUSTMENT WARNING LABEL
293	DISTANZIALE REGOLATORE	ADJUSTMENT BOARD SPACER
294	VITE FISS. REGOLATORE	ADJUSTMENT LOCKING SCREW
295	REGOLATORE DI POSIZIONE	ADJUSTER POSITION
296	OR TAPPO	PLUG O-RING
297	SPINA ANTIGIRO	ANTIREVOLUTION PIN
298	ETICHETTA CORPO MANOPOLA	KNOB BODY LABEL
300	ETICHETTA MANOPOLA	KNOB LABEL
301	GHIERA CARTER	CARTER RING NUT
302	OR CORPO RIDUTTORE	REDUCTION HOUSING O-RING
303	VITE FISSAGGIO STAFFA	BRACKET LOCKING SCREW
304	TARGHETTA DATI	NAMEPLATE
305	RIVETTO TARGHETTA	NAMEPLATE RIVET
306	RESISTENZA ANTICONDENSA	SPACE HEATER
307	VITE FISSAGGIO NONIO	NONIUS LOCKING SCREW
309	OR GHIERA CARTER	CARTER RING NUT O-RING
316	LIMITATORE DI COPPIA	TORQUE LIMITATOR
318	VITE FISS. CORPO	HOUSING LOCK. SCREW
319	SPINA CORPO	HOUSING PIN
321	OR TAPPO LETTURA	READING PLUG O-RING
328	COLONNA ECCENTRICA	ECCENTRIC COLUMN
329	VITE FISSAGGIO COLONNA	COLUMN LOCKING SCREW
331	VITE FISSAGGIO MOTORE	MOTOR LOCKING SCREW
332	OR TAPPO	PLUG O-RING
333	ALBERO DI MANOVRA	OPERATION SHAFT
334	GHIERA FISS. RIDUTTORE	REDUCT. UNIT LOCKING RING NUT
335	GHIERA RIDUTTORE	WORM REDUCTION RING NUT
338	VITE FISS. COP. MORSETTIERA	COVER LOCKING SCREW
339	TAPPO FORO PRESSACAVO	CABLE GLAND HOLE PLUG
340	SFERA	SPHERE
342	DISTANZIALE	SPACER
346	OR MANOPOLA	KNOB O-RING
348	OR TAPPO/PORTASENSORE	PLUG/SENSOR O-RING
355	OR ALBERO DI MANOVRA	OPERATION SHAFT O-RING
356	OR CORPO SELETTORE	SELECTOR BODY O-RING
360	CUSCINETTO MADREVITE	NUT SCREW BALL BEARING
364	SPINA RIDUTTORE	REDUCTION UNIT PIN
367	CUSCINETTO ANTIGIRO	ANTIREVOLUTION BALL BEARING
368	SEEGER ALBERO DI MANOVRA	OPERATION SHAFT SEEGER
371	FUSIBILE	FUSE
372	GUARNIZIONE	GASKET
375	VITE FISS. SENSORE	SENSOR LOCK. SCREW
376	SENSORE	SENSOR
377	SPIA DI LETTURA	READING PLUG
378	DADO	ROD NUT
379	ASTA	POLE
380	MAGNETE	MAGNET
381	STAFFA FISS. RESISTENZA	SPACE HEATER LOCKING BRACKET
420	NONIO	VERNIER
439	PORTA NONIO	HOUSING VERNIER
440	SEEGER	SEEGER

REV.	MODIFICHE	CONTR.	DATA
1	AGGIUNTA POS. 332		30/01/07
2	AGGIUNTA POS. 235, 348, SELETTORE "AUT-MAN" T.5854		20/05/08
3	AGGIORNATA		05/02/09

DISEGNATO: D. LISCO — CONTROLLATO ORIGINALE IN ROSSO — DISTRIBUZIONE: DA DT GQ PR UV UA UC PdC

SERVOCOMANDO ELETTRICO TIPO "Z"
REGOLATORE DI POSIZIONE CON MICROPROCESSORE

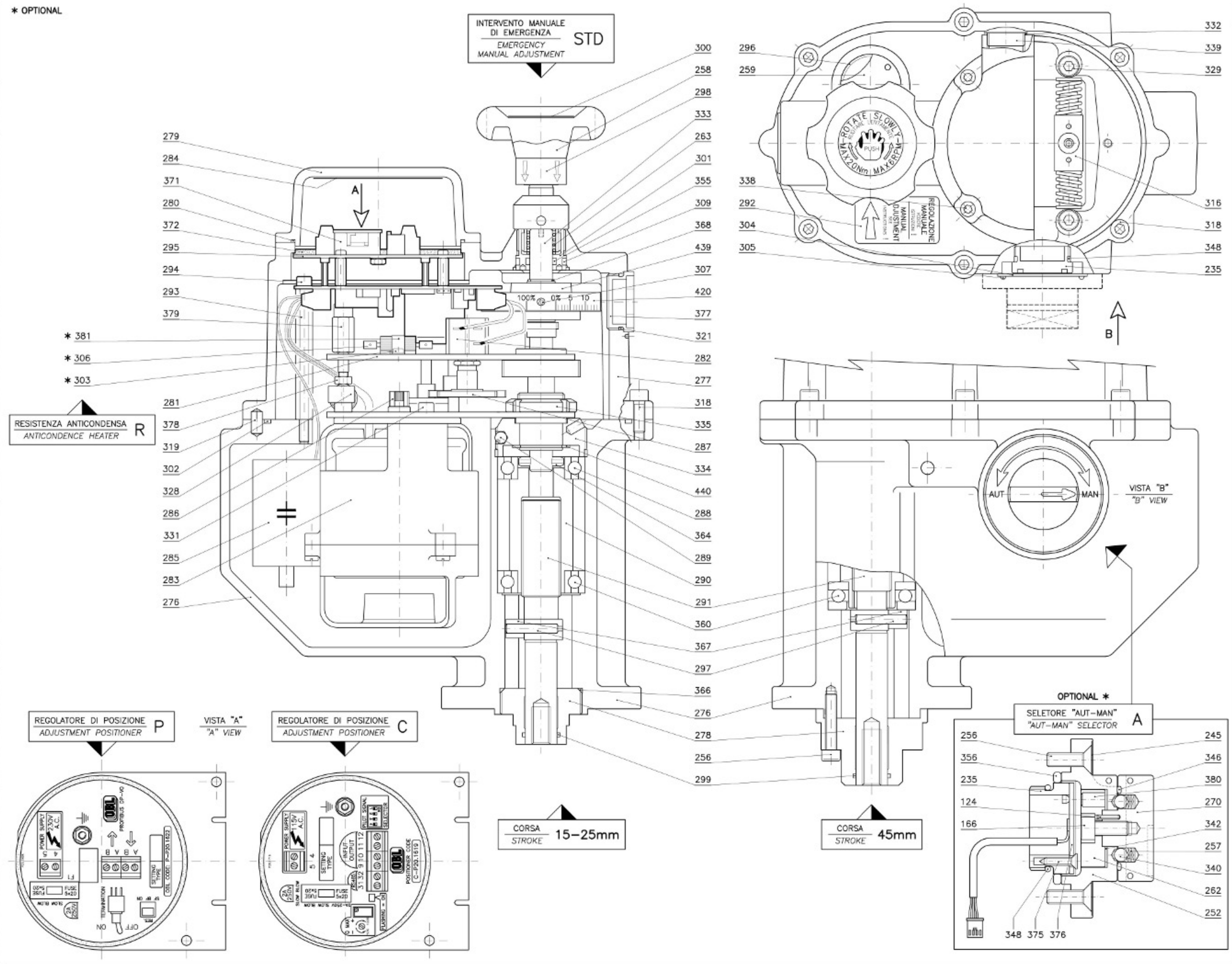
VALIDO PER CORSE 15 (XL), 25, 45 mm

TAVOLA 4897 — REV. 3 — LINGUA I/E — SOSTITUISCE IL – — DATA 29/06/04

SECTIONAL DRAWING

"Z" TYPE ELECTRIC ADJUSTER
MICROPROCESSOR POSITION ADJUSTER

FOR 15 (XL), 25, 45 mm STROKES ONLY



POS ITEM	COMPONENTI MECCANISMO	MECHANISM COMPONENTS
124	SPINA ELASTICA MANOPOLA	KNOB ELASTIC PIN
166	VITE FISS. MANOPOLA	KNOB LOCK. SCREW
235	TAPPO/PORTASENSORE	PLUG/SENSOR SUPPORT
245	ADESIVO "AUT-MAN"	"AUT-MAN" STICKER
252	CORPO SELETTORE	SELECTOR BODY
256	VITE FISSAGGIO GHIERA	RING NUT LOCKING SCREW
257	MOLLA	SPRING
258	MANOPOLA	SETTING KNOB
259	TAPPO	PLUG
262	PORTAMAGNETE	MAGNET HOUSING
263	MOLLA MANOPOLA	SETTING KNOB SPRING
270	MANOPOLA SELETTORE	SELECTOR KNOB
276	CORPO	HOUSING
277	CARTER	CARTER
278	GHIERA	RING NUT
279	COPERCHIO MORSETTIERA	TERMINAL BOARD COVER
280	O-RING COPERCHIO	COVER O-RING
281	GRUPPO RIDUTTORE	GEAR REDUCTION UNIT
282	POTENZIOMETRO	POTENTIOMETER
283	MOTORE	MOTOR
284	SCHEMA ELETTRICO ADESIVO	ADHESIVE WIRING DIAGRAM
285	CONDENSATORE	CONDENSER
286	PIGNONE	PINION
287	INGRANAGGIO POTENZIOMETRO	POTENTIOMETER GEAR WHEEL
288	CUSCINETTO MADREVITE	NUT SCREW BALL BEARING
289	SFERA DI FRIZIONE	FRICTION BALL
290	MADREVITE	NUT SCREW
291	VITE REGOLAZIONE	ADJUSTMENT SCREW
292	ETICHETTA AVVISO REGOLAZIONE	ADJUSTMENT WARNING LABEL
293	DISTANZIALE SCHEDA	PRINTED-CIRCUIT BOARD SPACER
294	VITE FISS. REGOLATORE	ADJUSTMENT LOCKING SCREW
295	REGOLATORE DI POSIZIONE	ADJUSTER POSITION
296	OR TAPPO	PLUG O-RING
297	SPINA ANTIGIRO	ANTIREVOLUTION PIN
298	ETICHETTA CORPO MANOPOLA	KNOB BODY LABEL
299	OR VITE REGOLAZIONE	ADJUST. SCREW O-RING
300	ETICHETTA MANOPOLA	KNOB LABEL
301	GHIERA CARTER	CARTER RING NUT
302	OR CORPO RIDUTTORE	REDUCTION HOUSING O-RING
303	VITE FISSAGGIO STAFFA	BRACKET LOCKING SCREW
304	TARGHETTA DATI	NAMEPLATE
305	RIVETTO TARGHETTA	NAMEPLATE RIVET
306	RESISTENZA ANTICONDENSA	SPACE HEATER
307	RIVETTO FISSAGGIO NONIO	NONIUS LOCKING RIVET
309	OR GHIERA CARTER	CARTER RING NUT O-RING
316	LIMITATORE DI COPPIA	TORQUE LIMITATOR
318	VITE FISS. CORPO	HOUSING LOCK. SCREW
319	SPINA CORPO	HOUSING PIN
321	OR SPIA LETTURA	READING PLUG O-RING
328	COLONNA ECCENTRICA	ECCENTRIC COLUMN
329	VITE FISSAGGIO COLONNA	COLUMN LOCKING SCREW
331	VITE FISSAGGIO MOTORE	MOTOR LOCKING SCREW
332	OR TAPPO	PLUG O-RING
333	ALBERO DI MANOVRA	OPERATION SHAFT
334	GHIERA FISS. RIDUTTORE	REDUCT. UNIT LOCKING RING NUT
335	GHIERA RIDUTTORE	WORM REDUCTION RING NUT
338	VITE FISS. COP. MORSETTIERA	COVER LOCKING SCREW
339	TAPPO FORO PRESSACAVO	CABLE GLAND HOLE PLUG
340	SFERA	SPHERE
342	DISTANZIALE	SPACER
346	OR MANOPOLA	KNOB O-RING
348	OR TAPPO/PORTASENSORE	PLUG/SENSOR O-RING
355	OR ALBERO DI MANOVRA	OPERATION SHAFT O-RING
356	OR CORPO SELETTORE	SELECTOR BODY O-RING
360	CUSCINETTO MADREVITE	NUT SCREW BALL BEARING
364	SPINA RIDUTTORE	REDUCTION UNIT PIN
366	OR GHIERA	RING NUT O-RING
367	CUSCINETTO ANTIGIRO	ANTIREVOLUTION BALL BEARING
368	SEEGER ALBERO DI MANOVRA	OPERATION SHAFT SEEGER
371	FUSIBILE	FUSE
372	GUARNIZIONE	GASKET
377	SPIA DI LETTURA	READING PLUG
375	VITE FISS. SENSORE	SENSOR LOCK. SCREW
376	SENSORE	SENSOR
378	DADO	ROD NUT
379	ASTA	POLE
380	MAGNETE	MAGNET
381	STAFFA FISS. RESISTENZA	SPACE HEATER LOCKING BRACKET
420	NONIO	VERNIER
439	PORTA NONIO	HOUSING VERNIER
440	SEEGER RIDUTTORE	REDUCTION UNIT SEEGER

SERVOCOMANDO ELETTRICO TIPO "Z"
REGOLATORE DI POSIZIONE CON MICROPROCESSORE

VALIDO SOLO PER CORSA 93 mm

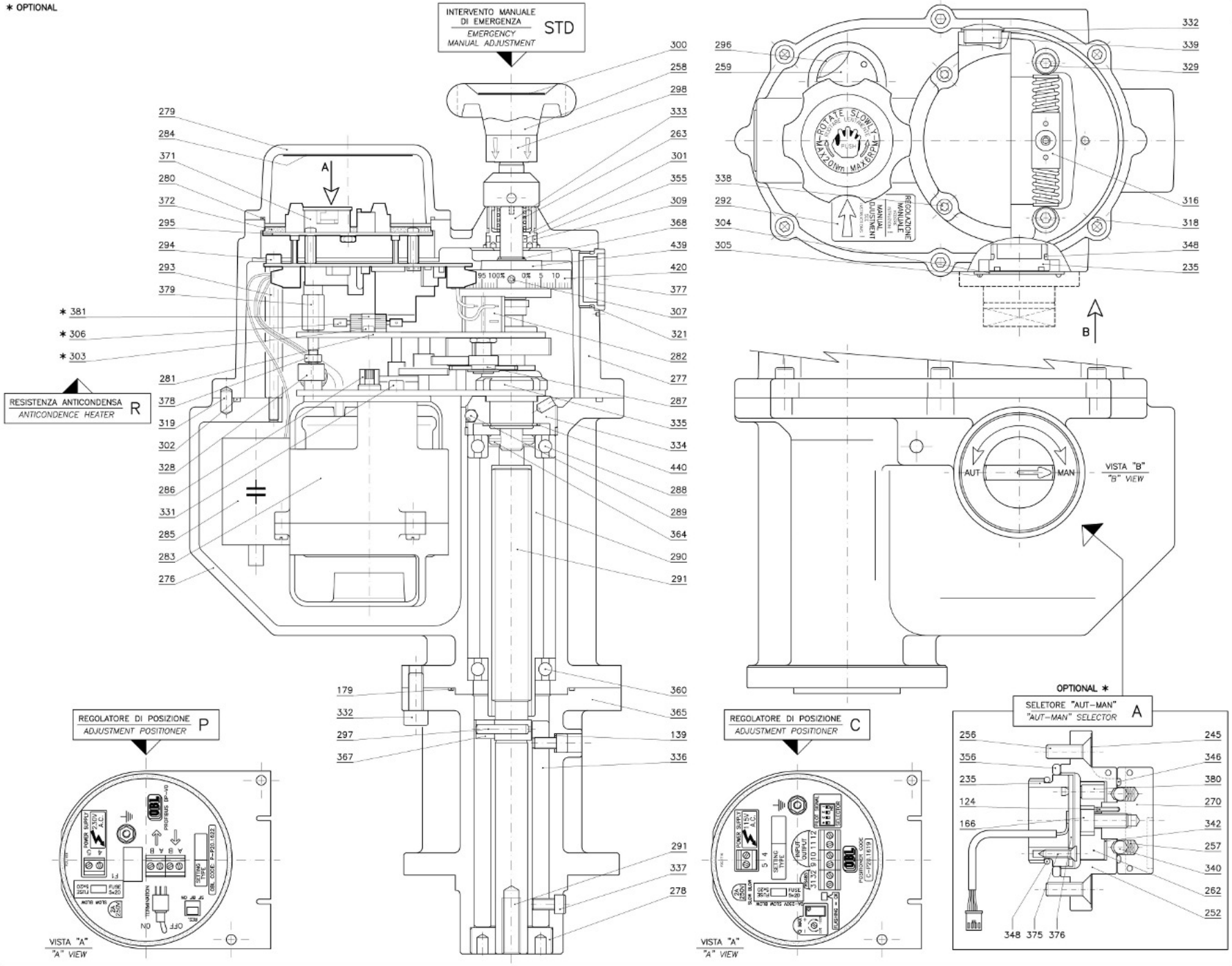
TAVOLA 5304 | REV. 3 | LINGUA I/E
SOSTITUISCE IL – | DATA 05/09/05

SECTIONAL DRAWING

"Z" TYPE ELECTRIC ADJUSTER
MICROPROCESSOR POSITION ADJUSTER

FOR 93 mm STROKES ONLY

* OPTIONAL



POS ITEM	COMPONENTI MECCANISMO / MECHANISM COMPONENTS	
124	SPINA ELASTICA MANOPOLA	KNOB ELASTIC PIN
139	GUARNIZIONE	SEAL
166	VITE FISS. MANOPOLA	KNOB LOCK. SCREW
179	OR TRONCHETTO	COUPLING O–RING
235	TAPPO/PORTASENSORE	PLUG/SENSOR SUPPORT
245	ADESIVO "AUT–MAN"	"AUT–MAN" STICKER
252	CORPO SELETTORE	SELECTOR BODY
256	VITE FISS. CORPO SELETTORE	SELECT. BODY LOCK. SCREW
257	MOLLA	SPRING
258	MANOPOLA	SETTING KNOB
259	TAPPO	PLUG
262	PORTAMAGNETE	MAGNET HOUSING
263	MOLLA MANOPOLA	SETTING KNOB SPRING
270	MANOPOLA SELETTORE	SELECTOR KNOB
276	CORPO	HOUSING
277	CARTER	CARTER
278	GHIERA	RING NUT
279	COPERCHIO MORSETTIERA	TERMINAL BOARD COVER
280	O–RING COPERCHIO	COVER O–RING
281	GRUPPO RIDUTTORE	GEAR REDUCTION UNIT
282	POTENZIOMETRO	POTENTIOMETER
283	MOTORE	MOTOR
284	SCHEMA ELETTRICO ADESIVO	ADHESIVE WIRING DIAGRAM
285	CONDENSATORE	CONDENSER
286	PIGNONE	PINION
287	INGRANAGGIO POTENZIOMETRO	POTENTIOMETER GEAR WHEEL
288	CUSCINETTO MADREVITE	NUT SCREW BALL BEARING
289	SFERA DI FRIZIONE	FRICTION BALL
290	MADREVITE	NUT SCREW
291	VITE REGOLAZIONE	ADJUSTMENT SCREW
292	ETICHETTA AVVISO REGOLAZIONE	ADJUSTMENT WARNING LABEL
293	DISTANZIALE SCHEDA	PRINTED–CIRCUIT BOARD SPACER
294	VITE FISS. REGOLATORE	ADJUSTMENT LOCKING SCREW
295	REGOLATORE DI POSIZIONE	ADJUSTER POSITION
296	OR TAPPO	PLUG O–RING
297	SPINA ANTIGIRO	ANTIREVOLUTION PIN
298	ETICHETTA CORPO MANOPOLA	KNOB BODY LABEL
300	ETICHETTA MANOPOLA	KNOB LABEL
301	GHIERA CARTER	CARTER RING NUT
302	OR CORPO RIDUTTORE	REDUCTION HOUSING O–RING
303	VITE FISSAGGIO STAFFA	BRACKET LOCKING SCREW
304	TARGHETTA DATI	NAMEPLATE
305	RIVETTO TARGHETTA	NAMEPLATE RIVET
306	RESISTENZA ANTICONDENSA	SPACE HEATER
307	RIVETTO FISSAGGIO NONIO	NONIUS LOCKING RIVET
309	OR GHIERA CARTER	CARTER RING NUT O–RING
316	LIMITATORE DI COPPIA	TORQUE LIMITATOR
318	VITE FISS. CORPO	HOUSING LOCK. SCREW
319	SPINA CORPO	HOUSING PIN
321	OR SPIA LETTURA	READING PLUG O–RING
328	COLONNA ECCENTRICA	ECCENTRIC COLUMN
329	VITE FISSAGGIO COLONNA	COLUMN LOCKING SCREW
331	VITE FISSAGGIO MOTORE	MOTOR LOCKING SCREW
332	VITE FISSAGGIO TRONCHETTO	COPLING FLANGE LOCK. SCREW
333	ALBERO DI MANOVRA	OPERATION SHAFT
334	GHIERA FISS. RIDUTTORE	REDUCT. UNIT LOCKING RING NUT
335	GHIERA RIDUTTORE	WORM REDUCTION RING NUT
336	ANTIGIRO	ANTIREVOLUTION
337	VITE FISS. ANELLO ANTIGIRO	ANTIREV. RING LOCK. SCREW
338	VITE FISS. COP. MORSETTIERA	COVER LOCKING SCREW
339	TAPPO FORO PRESSACAVO	CABLE GLAND HOLE PLUG
340	SFERA	SPHERE
342	DISTANZIALE	SPACER
346	OR MANOPOLA	KNOB O–RING
348	OR TAPPO/PORTASENSORE	PLUG/SENSOR O–RING
355	OR ALBERO DI MANOVRA	OPERATION SHAFT O–RING
356	OR CORPO SELETTORE	SELECTOR BODY O–RING
360	CUSCINETTO MADREVITE	NUT SCREW BALL BEARING
364	SPINA RIDUTTORE	REDUCTION UNIT PIN
365	TRONCHETTO DI UNIONE	COUPLING FLANGE
367	CUSCINETTO ANTIGIRO	ANTIREVOLUTION BALL BEARING
368	SEEGER ALBERO DI MANOVRA	OPERATION SHAFT SEEGER
371	FUSIBILE	FUSE
372	GUARNIZIONE	GASKET
375	VITE FISS. SENSORE	SENSOR LOCK. SCREW
376	SENSORE	SENSOR
377	SPIA DI LETTURA	READING PLUG
378	DADO	ROD NUT
379	ASTA	POLE
380	MAGNETE	MAGNET
381	STAFFA FISS. RESISTENZA	SPACE HEATER LOCKING BRACKET
420	NONIO	VERNIER
439	PORTA NONIO	HOUSING VERNIER
440	SEEGER RIDUTTORE	REDUCTION UNIT SEEGER

REV.	MODIFICHE	CONTR.	DATA
1	AGGIUNTA POS. 332		30/01/07
2	AGGIUNTA POS. 235, 348, SELETTORE "AUT–MAN" T.5954		20/05/08
3	AGGIORNATA		05/02/09

DISEGNATO M.LEOPIZZI | CONTROLLATO ORIGINALE IN ROSSO | DISTRIBUZIONE