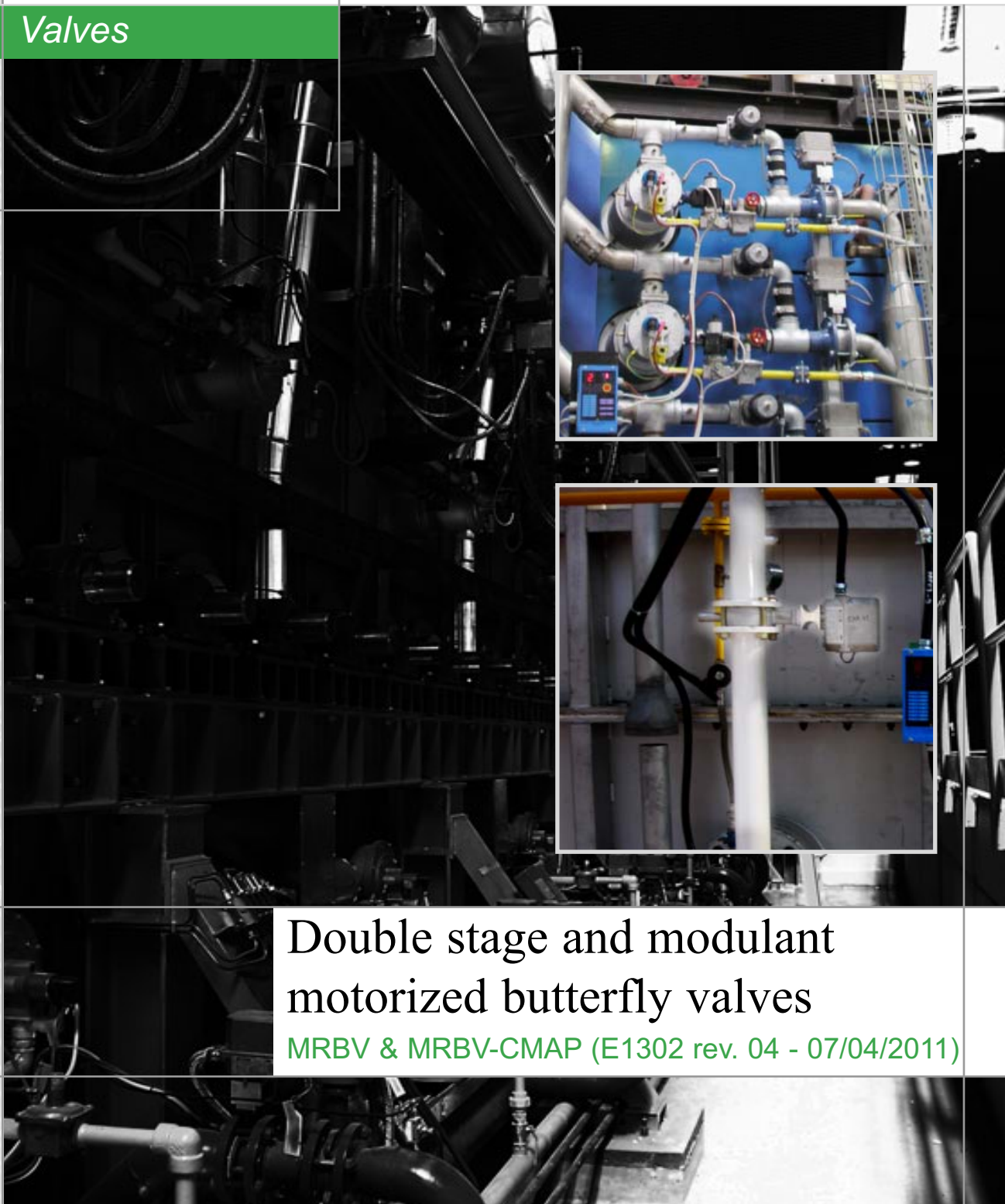


Valves



Double stage and modulant
motorized butterfly valves

MRBV & MRBV-CMAP (E1302 rev. 04 - 07/04/2011)



GENERAL WARNINGS:



■ All installation, maintenance, ignition and setting must be performed by qualified staff, respecting the norms present at the time and place of the installation.

■ To avoid damage to people and things, it is essential to observe all the points indicated in this handbook. The reported indications do not exonerate the Client/User from observing general or specific laws concerning accidents and environmental safeguarding.

■ The operator must wear proper DPI clothing (shoes, helmets...) and respect the general safety, prevention and precaution norms.

■ To avoid the risks of burns or high voltage electrocution, the operator must avoid all contact with the burner and its control devices during the ignition phase and while it is running at high temperatures.

■ All ordinary and extraordinary maintenance must be performed when the system is stopped.

■ To assure correct and safe use of the combustion plant, it is of extreme importance that the contents of this document be brought to the attention of and be meticulously observed by all personnel in charge of controlling and working the devices.

■ The functioning of a combustion plant can be dangerous and cause injuries to persons or damage to equipment. Every burner must be provided with certified combustion safety and supervision devices.

■ The burner must be installed correctly to prevent any type of accidental/undesired heat transmission from the flame to the operator or the equipment.

■ The performances indicated in this technical document regarding the range of products are a result of experimental tests carried out at ESA-PYRONICS. The tests have been performed using ignition systems, flame detectors and supervisors developed by ESA-PYRONICS. The respect of the above mentioned functioning conditions cannot be guaranteed if equipment, which is not present in the ESA-PYRONICS catalogue, is used.

DISPOSAL:



To dispose of the product, abide by the local legislations regarding it.

GENERAL NOTES:



■ In accordance to the internal policy of constant quality improvement, ESA-PYRONICS reserves the right to modify the technical characteristics of the present document at any time and without warning.

■ It is possible to download technical sheets which have been updated to the latest revision from the **www.esapyronics.com** website.

CERTIFICATIONS:



EN746-2

The products manufactured by ESA-PYRONICS have been created in conformity to the **UNI EN 746-2** Norms: Equipment for industrial thermal process - Part 2: Safety requirements for combustion and the movement and treatment of combustible elements. This norm is in harmony with the Machine Directive **98/37/CE**. It is certified that the products in question respect all the requirements prescribed by the above mentioned Norms and Directives. These have been designed, produced, controlled and tested in accordance to the company's internal procedures for quality control, certified in conformity with the **UNI EN ISO 9001** Norm by DNV Italia s.r.l.



Conforms to the **2006/95/CE** (low voltage) Directive.



The products conform to the Russian market requirements according to the **GOST** and **GOSGORTEKHNAZOR** certification.

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The MRBV & MRBV-CMAP series butterfly valves are suitable for double stage regulation or modulation of ambient temperature air flow in low pressure ducts. A screw-type organ placed on the butterfly valve shaft allows for easy minimum flow regulation with the valve closed.

APPLICATIONS

- Air flow regulation for impulse controlled burners (ON/OFF or OFF/MIN/MAX).
- Air flow regulation for modulant burners with minimum adjustable mechanical by-pass.

CHARACTERISTICS - MRBV

VALVE

- Maximum working pressure: 210 mbar
- Maximum fluid temperature: 200°C
- Drawing capacity with closed valve: about 2%
(with closed by-pass seat)
- Available sizes from DN65 PN16 to DN150 PN16
- Coupling flanges: excluded
- Flange gaskets: excluded

ELECTRIC MOTOR UNIT

- Model: ECON-V
- Couple: 5Nm
- Voltage supply: 24/115/230Vac +10 ÷ -5%
- Frequency supply: 50 ÷ 60Hz
- Command signal: ON/OFF
- Working temperature: -10°C ÷ +50°C
- Storage temperature: -20°C ÷ +80°C
- Absorption: 4VA
- n° 2 optional auxiliary switch flow: 5A/250Vac
- Rotation angle: 90°
- 90° rotation time: 7,5 sec.
- Manual command: force open
- Protection degree: IP54
- Mass: 1,7 Kg
- Electric cable inlet: nr. 2 threaded inlets PG 13,5
- Mounting position: any
- Servocontrol attachment holes: DIN ISO 5211 F07
- Working environment: not appropriate in explosive or corrosive environments

MATERIAL COMPOSITION:

- Valve body: cast iron G40
- Lens holder shaft: AISI303
- Valve disc: AISI304
- Minimum adjustment screw: brass
- Motor unit case: molten-pressed aluminium
- Motor unit support: aluminium
- Surface treatment : phosphate coated

MRBV



F130203

MRBV



F130204

CHARACTERISTICS - MRBV-CMAP

VALVE

- Maximum working pressure: 210 mbar
- Maximum fluid temperature: 200°C
- Drawing capacity with valve closed: about 2%
(with by-pass seat closed)
- Available sizes from DN65 PN16 to DN150 PN16
- Coupling flanges: excluded
- Flange gaskets: excluded

ELECTRIC MOTOR UNIT:

- Model: ECON-O
- Couple: 20Nm (options 4Nm/7Nm/15Nm)
- Voltage supply: 24/115/230Vac +10 ÷ -5%
- Frequency supply: 50 ÷ 60Hz
- Command signal: open/close or proportional
- Type of proportional command: 0-10V 4-20mA
(only for ECON-O 24 Vac)
- Working temperature: -10°C ÷ +60°C
- Storage temperature: -20°C ÷ +80°C
- Absorption: 7VA
- n° 2 optional auxiliary switch flow: 5A/250Vac
- Open/close mod. potentiometer feedback:
nr.1 1000 Ohm
(options 150 Ohm/1000 Ohm/2500 Ohm)
- Proportional mod. feedback signal: 0-10Vdc
- Rotation angle: 90°
- 90° rotation time: 60 sec.
(options from 7 sec. to 120 sec.)
- Lever shaft connection: panel 9,5 mm
- AUTO-MAN command station: included
- Protection degree: IP54
- Mass: 2,5 Kg
- Electric cable inlet: nr. 2 threaded inlets PG 13,5
- Mounting position: any
- Working environment: not appropriate in explosive or
corrosive environments

MATERIAL COMPOSITION:

- Valve body: cast iron G40
- Lens holder shaft: AISI303
- Valve disc: AISI304
- Minimum regulation screw: brass
- Motor unit case: molten-pressed aluminium
- Motor unit support plate: Fe360
- Motor unit coupling rod: Fe360
- Valve command lever: brass
- Surface treatment: phosphate and zinc coated

MRBV-CMAP



F1302I05

MRBV-CMAP



F1302I06

DESCRIPTION

The MRBV series butterfly valves are divided into two categories: double stage regulation valves, identified by the code MRBV and the modulant regulation valves identified by MRBV-CMAP. The valves have been created to allow easy use for the operator. They are made up of a butterfly valve body and a series of leverages placed at the ends. A screw type mechanism allows minimum flow regulation with the valve closed. The MRBV and MRBV-CMAP are meant for automatic applications in which the opening and closing of the butterfly is controlled by an electric motor unit.

The MRBV valves have the motor unit directly connected to the valve spindle; an auxiliary limit switch signals the open valve position.

In the MRBV-CMAP models, the motor unit is mounted

on a support plate and is connected to the valve spindle via a system of slotted levers, rods and adjustable joints, to improve the calibration control according to the application needs. The support plate picturing allows for different types of motor units to be mounted due to the fact that the ECON-O model is not applicable.

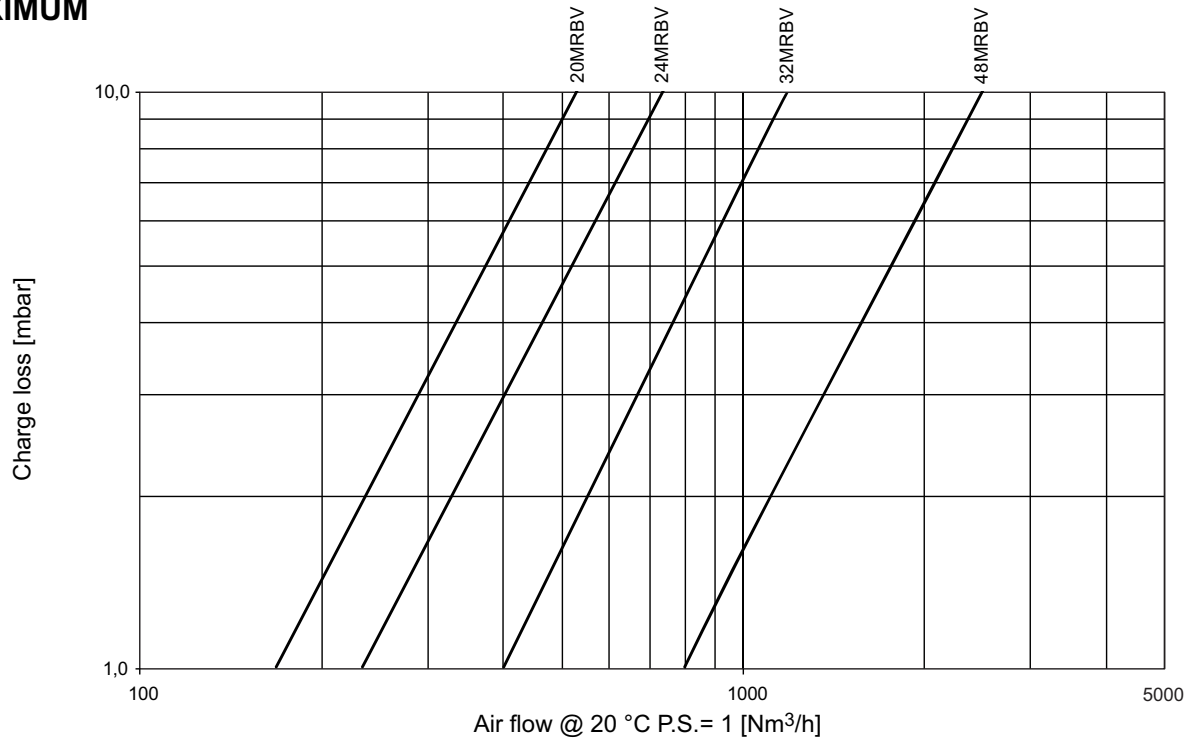
ESA-PYRONICS supplies the MRBV-CMAP valves with ECON-O motor unit predisposed for regulation from 0 ÷ 90°. All the motor units have a manual command station, two auxiliary limit switches calibrated at 10° and 80° as well as a feedback signal for the position reached. In particular in the models with open/close command the feedback takes place via an ohmic potentiometer, whilst in the models with proportional command an analogical signal in volts is available.

FLOW CHART

The choice of MRBV valves must be made according to the specific use: if the valve must be used as an interception device, it must have the same diameter as the piping; if it must be used as a regulation organ, it must guarantee a charge loss which is compatible with an appropriate regulation.

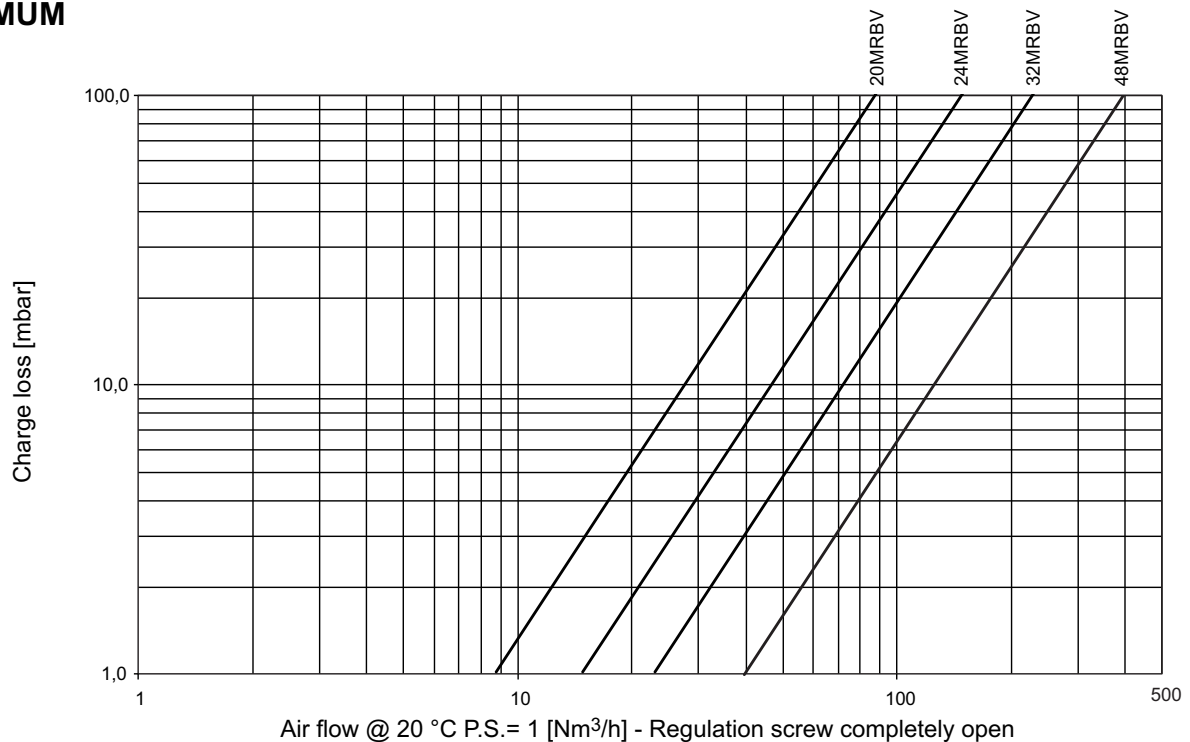
The maximum flow graph identifies the charge loss with a completely open valve. The minimum flow graph instead, identifies the charge loss with a completely closed valve and regulation screw completely open.

MAXIMUM



G1302I01

MINIMUM



G1302I02

WARNINGS

■ Make sure that working pressure and fluid temperature is lower than the maximum allowed values.

■ The MRBV valves are supplied without coupling flanges and gaskets. The flanges and gaskets to be applied must be suitable for the type of valve and its application.

■ Check the correct installation of the valve before starting the flow in the pipeline.

■ Check the correct electric connections. Before connecting electricity to the motor unit, make sure that the voltage, frequency and command signals are correct. Check that the user's absorption is not higher than the maximum flow of the auxiliary contacts.

■ The motor unit is intended to be electrically connected on a permanent basis. Inverting the connection phase/neutro can compromise the safety of the system.

Do not use different phases among the various voltage inlets and do not apply tension on the outlet clamps.

■ Only intervene on the motor unit and its connected devices when there is no voltage supply (electric current disconnected). Number the conductors before disconnecting the device.

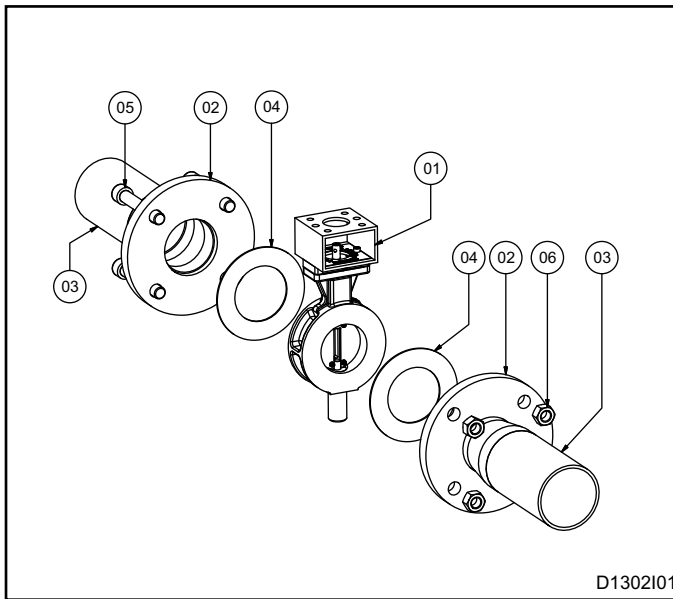
■ To avoid damaging the internal adapter, do not rotate the motor unit shaft neither by forcing the lever nor with tools.

■ In case of motor unit malfunctioning, follow the instructions in the "MAINTENANCE" chapter of the present manual or contact ESA-PYRONICS assistance.

■ Any modification or repair done by third parties may compromise the application safety and will automatically cause the general warranty conditions to expire.

INSTALLATION

To install carefully follow the instructions below:



ASSEMBLY

1 - Place the MRBV valves far from excessive heat sources and products such as: liquids, solvents or corrosive gases.

2 - The valve (**pos. 01**) may be installed in any position.

Maintain a certain distance from surrounding elements allowing air to circulate freely.

3 - Check that the flanges (**pos. 02**), gaskets (**pos. 04**) and pipes (**pos. 03**) are compatible with the valve and with the fluid.

4 - Check the correct alignment of the pipe fittings and check the correct distance between the pipes and the assembly (flanges/gaskets/valve body), to avoid exerting tension on the pipes during the tightening phase.

5 - Weld the flanges (**pos.02**) at the ends of the pipes, eliminating any residual flash.

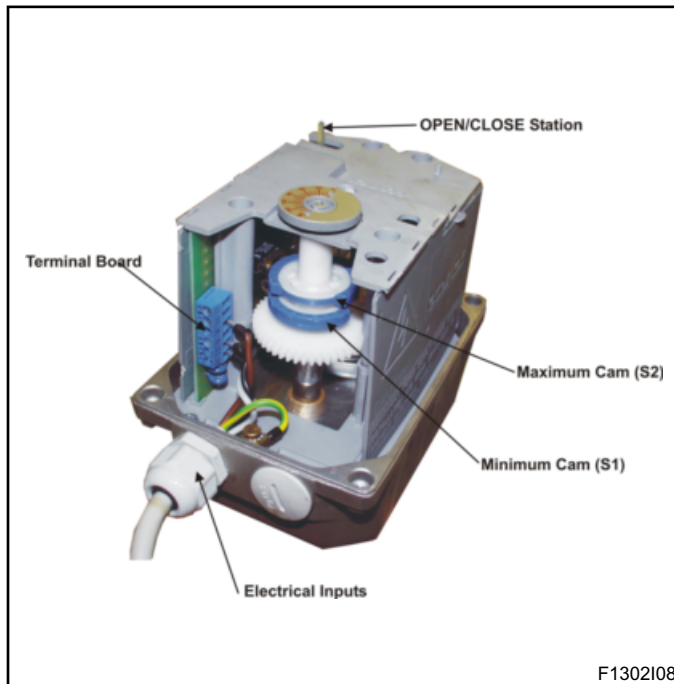
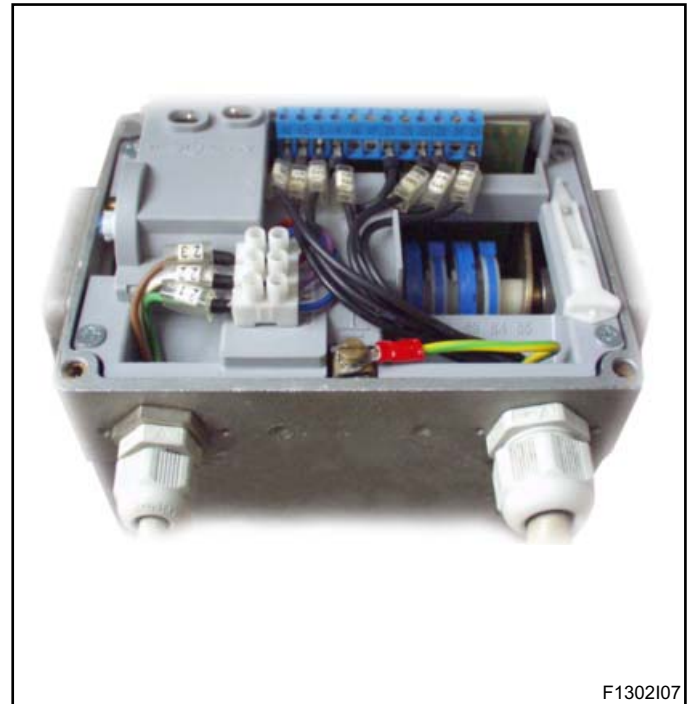
6 - Make sure that there are no foreign objects inside the valve nor in the pipes before proceeding to assemble. If necessary remove the impurities.

7 - Position the valve between the two flanges and then mount the gaskets (**pos. 04**), bolts (**pos.05**), washers and nuts (**pos. 06**).

8 - Using appropriate instruments, progressively screw the bolts on crossing them over each other, avoiding excessive tightening.

ELECTRICAL CONNECTION

- 1** - Check that the motor unit is compatible with the control system, both for voltage supply as well as for the type of command.
- 2** - Use the inlets that have already been placed on the motor unit for the passage of electric cables, without making other holes in the case. Install cable glands or conduit fittings made to warranty a protection degree equal to or not less than IP40. For systems used in open air, the minimum protection degree must be IP54. The protection degree can also be guaranteed by the container in which the device has been put.
- 3** - The signal command cable of the proportional motor unit must be screened and layed out separately from the power lines (inverter) and network voltage; multipolar cables must not be used. The same applies to the position feedback signals of both motor unit models; open/close as well as proportional type.
- 4** - If the power feed system is a phase-phase type, it is necessary to install an insulation transformer with a secondary earthing connection.



- 5** - When connecting electricity refer to the technical documentation, respecting the polarity between phase and neutral. The electrical connection clamps are screw-on type and can accept section conductors from 0.5 to 2.5mm²; the choice of conductors and their location must be suitable for the application. The numbering and use of appropriate terminals on these conductors is suggested.
- 6** - Always make sure that earthing protection is connected to the relative clamps and to the motor unit box by conductors with appropriate sections.
- 7** - After connecting make sure the conductors do not interfere internally with the motor unit's gear system. Close the lid, checking the correct position of the gasket and verifying that the conductors do not remain pressed between the lid and the box.

REGULATION AND SETTING

The operations indicated in the following chapter must be carried out by expert qualified technicians. During the regulation phase monitor the duct flow using flowmeters (calibrated flanges, differential pressure gauges, etc...)

MRBV VALVE

The regulation and setting of the motorized MRBV valves defines the maximum and minimum opening of the valve which is controlled by the electric motor unit. The two limit positions of the valve movement must correspond to the minimum and maximum flow desired. The minimum flow regulation takes place by regulating the minimum screw with the valve closed, whereas the maximum regulation is actuated by reducing the motor unit's stroke.

When the valve is fed without command, it is in the closed position. Once it receives the command signal, the butterfly places itself in the maximum opening position.

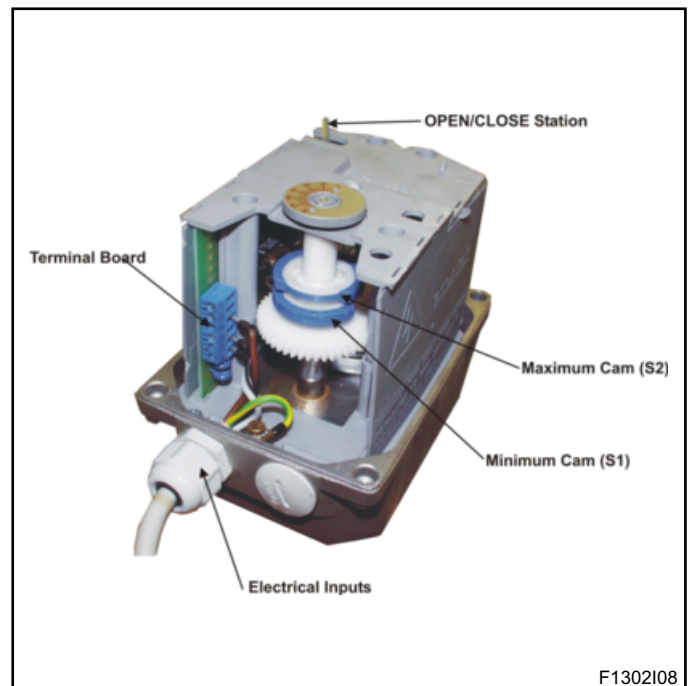
- 1 - Open the motor unit lid to get access to the manual command station, after which, connect the motor unit to the electrical supply.
- 2 - Check that there is no opening command and that the OPEN/CLOSE switch is on the CLOSE position. In these conditions the valve must be closed.
- 3 - Extract the security dowel (**pos.1**) from the valve spindle and act on the regulation screw (**pos.2**) screwing on to decrease and unscrewing to increase thus obtaining the requested minimum flow. After regulation, screw the security dowel back onto the spindle again (**pos. 1**) checking that the flow regulation does not vary.
- 4 - Place the OPEN/CLOSE switch in the OPEN position, so that the shaft rotates allowing the valve to open completely. The S2 cam defines the opening limit position.
- 5 - Check the flow value with valve completely open: if the value is higher than the maximum requested value, the motor unit stroke must be reduced, making the maximum opening of the cam intervene in advance (S2).
- 6 - Place the OPEN/CLOSE switch in the CLOSE position.

tion so that the shaft rotates making the valve close completely.

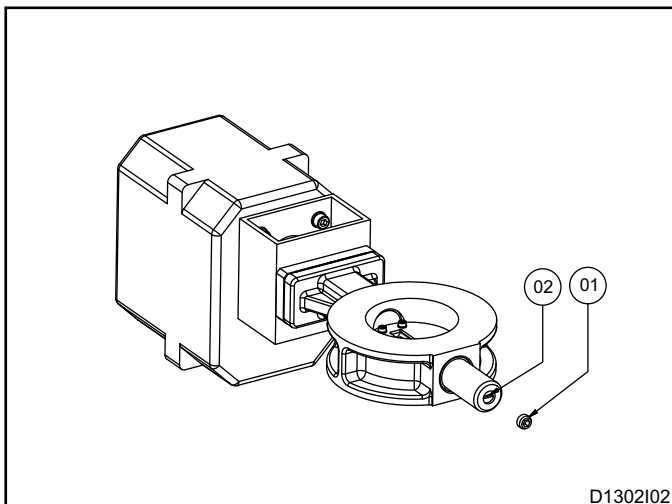
7 - Make the maximum opening limit switch intervene in advance using the straight side of the appropriate lever: insert the pivot in one of the holes situated on the sides of the mobile cam crown then drag it to the desired position. If the mobile crown is in the completely backward position, use the curved side of the lever to drag it to a more suitable position for regulation.

8 - Remove the lever before starting the motor unit. Via the OPEN/CLOSE switch, move the motor unit checking that there is the maximum flow requested in the new valve open position.

9 - Place the OPEN/CLOSE switch in the CLOSE position checking that the motor unit respects the control system commands. Finally, close the lid again, checking that the gasket is in the correct position and making sure that the conductors do not remain pressed between the lid and the box.



F1302I08



D1302I02

The ECON-V motor units are supplied by the factory already prepared for a 90° rotation on ON/OFF command. The S3 and S4 limit switches are optional and only available on request.

For the S3 and S4 limit switch regulation, follow the instructions below:

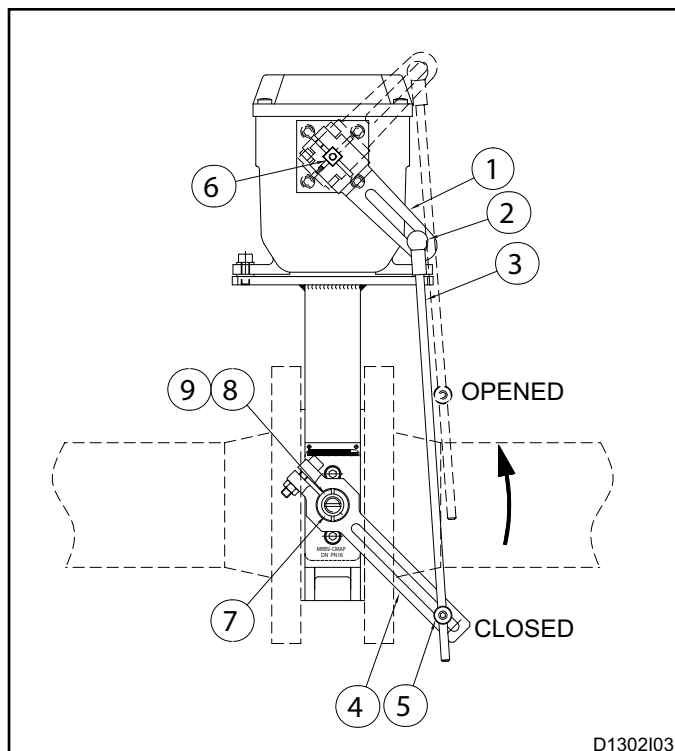
- 1 - Open the motor unit lid to have access to the manual command station.

- 2 - Via the OPEN/CLOSE switch, place the valve in the desired position, corresponding to the limit switch activation.
- 3 - Regulate the limit switch cams using the straight side of the appropriate lever: insert the pivot in one of the holes situated on the sides of the mobile cam crown then drag it to the desired position. If the mobile crown is in the completely backward position, use the curved side of the lever to drag it to a more suitable position for regulation.
- 4 - Remove the lever before starting the motor unit. Via the OPEN/CLOSE switch, move the motor unit checking that the limit switch activation is in the correct position.
- 5 - Then place the OPEN/CLOSE switch in the CLOSE position and close the lid again checking the position of the gasket and conductors.

MRBV-CMAP VALVE

The regulation and calibration of the motorized MRBV-CMAP defines the minimum and maximum opening of the valve controlled by the electric motor unit. The two limit positions of the valve movement correspond to the minimum and maximum flow desired. The minimum flow regulation takes place by regulating the minimum screw with valve closed, whilst the regulation of maximum flow takes place by varying the rotation angle of the valve compared to the motor unit, acting on the intermediate controls and joints. Decreasing the motor unit stroke is unadvisable, for models with open/close command, whereas for proportional motor units, it is impossible.

- 1 - Open the motor unit lid to get access to the manual command station. Place the AUTO/MAN commutator on



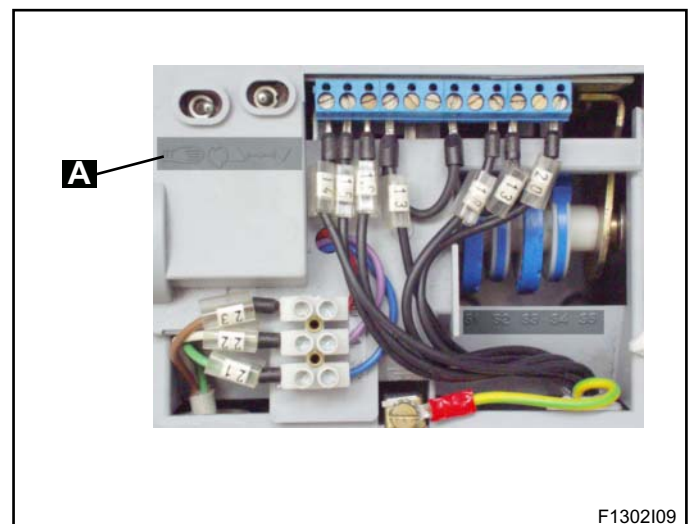
the manual position indicated by the hand **A**, after which, activate electric current to the motor unit.

- 2 - Place the OPEN/CLOSE switch on the ▼ symbol (closed), so that the shaft rotates in the clockwise direction making the valve close completely. The S1 cam defines the closed position limit.

- 3 - Extract the security dowel (**pos.8**) from the valve spindle (**pos.7**) and adjust the regulation screw (**pos.9**) screwing on to decrease and unscrewing to increase, obtaining the minimum flow requested. After regulation, screw the security dowel back onto the spindle again (**pos.8**) making sure that the flow regulation does not change.

- 4 - Place the OPEN/CLOSE switch on the ▲ symbol (open), so that the shaft rotates in the anticlockwise direction opening the valve completely. The S2 cam defines the opening position limit. Check the regulated flow of the valve during the amplitude between maximum and minimum opening positions.

- 5 - Evaluate the flow regulation carried out by the valve: if the maximum flow is reached before the motor unit gets to the maximum opening, the valve stroke must be reduced, otherwise it must be increased.



ced, otherwise it must be increased.

- 6 - Put the valve back to the minimum opening (see point 2) until the motor unit stops.

- 7 - Change the position of the joints (**pos.02** and **pos.05**) making them slide into the appropriate jointed levers (**pos.01** e **pos.04**). To decrease the valve stroke compared to the motor unit it is necessary to bring the joint (**pos.02**) closer to the motor unit pivot (**pos.06**), or move the joint (**pos. 05**) away from the valve pivot (**pos.07**). The difference between the two actions is that, with equal displacement, the one carried out on the jointed lever motor unit (**pos.01**) changes the valve angle more.

- 8 - Loosen the rod security dowel which is placed on the valve joint (**pos.05**). Manually adjust the minimum opening of the valve making the rod slide (**pos.03**) inside the joint moving the valve via its appropriate jointed lever (**pos.04**), obtaining the minimum flow previously regulated (see point 3). At the end fasten the security dowel.

- 9 - Check the new regulation of the valve by repeating the

operations indicated between points 4 and 8 until obtaining the requested flow regulation.

10 - Place the AUTO/MAN commutator on the automatic position checking that the motor unit respects the system's control commands. Finally, close the lid again, checking the correct position of the gasket and making sure that the conductors do remain pressed between the lid and the box.

The ECON-O motor units are supplied by the factory already prepared for a 90° rotation, with the S3 and S4 limit switches respectively regulated at 10° (S3 minimum opening) and 80° (S4 maximum opening). For the open/close motor units the potentiometer is set for a 90° angle rotation. If the motor unit's rotation is reduced, the resistance variation will be reduced proportionally, whereas if the angle is increased, there will be no further increase in resistance. For motor units with proportional command, all calibrations have already been set by the factory and therefore any intervention on the cam limits (S1 and S2) and on the potentiometer is inadvisable.

To adjust the S3 and S4 auxiliary switches follow the indications below:

1 - Open the motor unit lid to get access to the manual command station. Place the AUTO/MAN commutator on the manual position shown by the hand **A**.

2 - Using the OPEN/CLOSE switch, place the valve in the desired position, corresponding to the activation of the limit switch.

3 - Regulate the limit switch cam using the straight side of the appropriate lever: insert the pivot in one of the holes situated on the sides of the cam's mobile crown and drag it to the position desired. In case the mobile crown is in the completely backward position, use the curved side of the lever to drag it to the position most suitable for regulation.

4 - Remove the lever before starting the motor unit. Via the OPEN/CLOSE switch, move the motor unit checking that the limit switch is in the correct position.

5 - Finally place the AUTO/MAN commutator in the automatic position and close the lid checking the position of the gasket and conductors.

GENERAL MAINTENANCE PLAN

Operation	Type (*)	Suggested Schedule	Notes
Gasket integrity	O	annual	Check that there are no air fume leaks towards the outside.
Bolt tightening	E	annual	In case there are vibrations, reduce to half yearly application.
Motor unit cable connection integrity	O	half yearly	Check external insulation integrity as well as the absence of abrasions or overheating of conductors.
Valve movement	O/E	half yearly	Check that the valve movement is not hindered in any way.
Valve regulation	O/E	annual	Check the flow regulation carried out by the valve.
Electric motor unit	O/E	annual	Check that the commands are respected and check that the auxiliary switches and the feedback signals are correct.
Minimum regulation screw integrity	E	annual	Check the condition, cleanliness and functioning of the screw.
Butterfly valve maintenance	E	annual	Check the condition of the internal elements of the valve.

NOTES:

Key: O = ordinary / E = extraordinary

(*) It is advisable to replace the gaskets each time the valve is dismantled.

EXTRAORDINARY MAINTENANCE

For correct maintenance of the MRBV valves, scrupulously follow the instructions below. Before manouvring anything with the plant on, make sure that the process and operator safety is not compromised. If necessary perform maintenance checks with the plant off.

INTEGRITY CHECKS

■ The integrity of the gaskets can be checked visually. If the use of leak detection liquid is necessary, only check if the flow inside the duct is cold and in low pressure.

■ The integrity of the electric cables can be checked visually. If it is necessary to operate on the conductors to check the cables, they should not be fully visible, disconnect power supply running to the device before carrying out any operation. Before replacing the motor unit, make sure that this is indeed the cause of malfunctioning.

VALVE MOVEMENT

■ Checking that there is nothing hindering the valve movement must be done by performing a complete ampli-

tude, visually checking that there is no friction nor stroke limits. If the valve is an air or fume interception valve, before performing the operation, switch off the connected burners.

VALVE REGULATION - ELECTRIC MOTOR UNIT

■ Check valve regulation with burners off but with the presence of flow in the duct. Check that the flow regulation carried out by the valve is correct, if necessary repeat all the steps indicated in the "REGULATION AND SETTINGS" section.

■ Check the motor unit with burners off, with or without flow in the duct. Check that the commands sent by the control system are carried out by the motor unit and that the feedback position and auxiliary switch signals send the control system the correct indications. If necessary repeat all the steps indicated in the "REGULATION AND SETTINGS" section.

EXTRAORDINARY MAINTENANCE

For correct maintenance of the MRBV valves, scrupulously follow the instructions below that are to be carried out when the plant is off.

BOLT TIGHTENING

■ The bolt tightening check must be made when the plant is off and cold.

BUTTERFLY VALVE MAINTENANCE - GASKET REPLACEMENT

1 - Close the interception valve upstream the piping and make sure that there is no flow in the duct.

2 - Place the valve in the completely closed position, otherwise it is impossible to extract the piping.

3 - Progressively unscrew the screws which fix the valve in a crossed position. Extract the valve and check the state of its internal components.

4 - Clean the inside of the valve body and the butterfly with a clean cloth and compressed air. Do not use tools that could damage the internal parts.

5 - Check that the fixing screws on the lens holder shaft are tightened correctly.

6 - Make sure that the butterfly moves freely without friction. If necessary lubricate with mineral oil which is suitable for high temperatures.

7 - Replace the gaskets and reassemble the valve in its place, following the steps indicated in the "INSTALLATION" section.

8 - Finally check that the valve moves freely without hindrance.

9 - Check that the regulation carried out by the valve is correct, if necessary repeat all the steps indicated in the "REGULATION AND SETTING" chapter.

MOTOR UNIT REPLACEMENT

1 - Make sure the motor unit is indeed the cause of malfunctioning and check that you have a spare motor unit which is the same as the one that needs to be replaced.

2 - Disconnect electric supply, remove the lid of the motor unit and then disconnect all electrical connections from the clamp.

3 - Unhook the jointed lever (**pos. 01**) from the pivot on the motor unit (**pos. 06**) without loosening the regulation of the joints (**pos. 02 e pos.05**), to facilitate the regulation operations afterwards (motor unit pivot position constant).

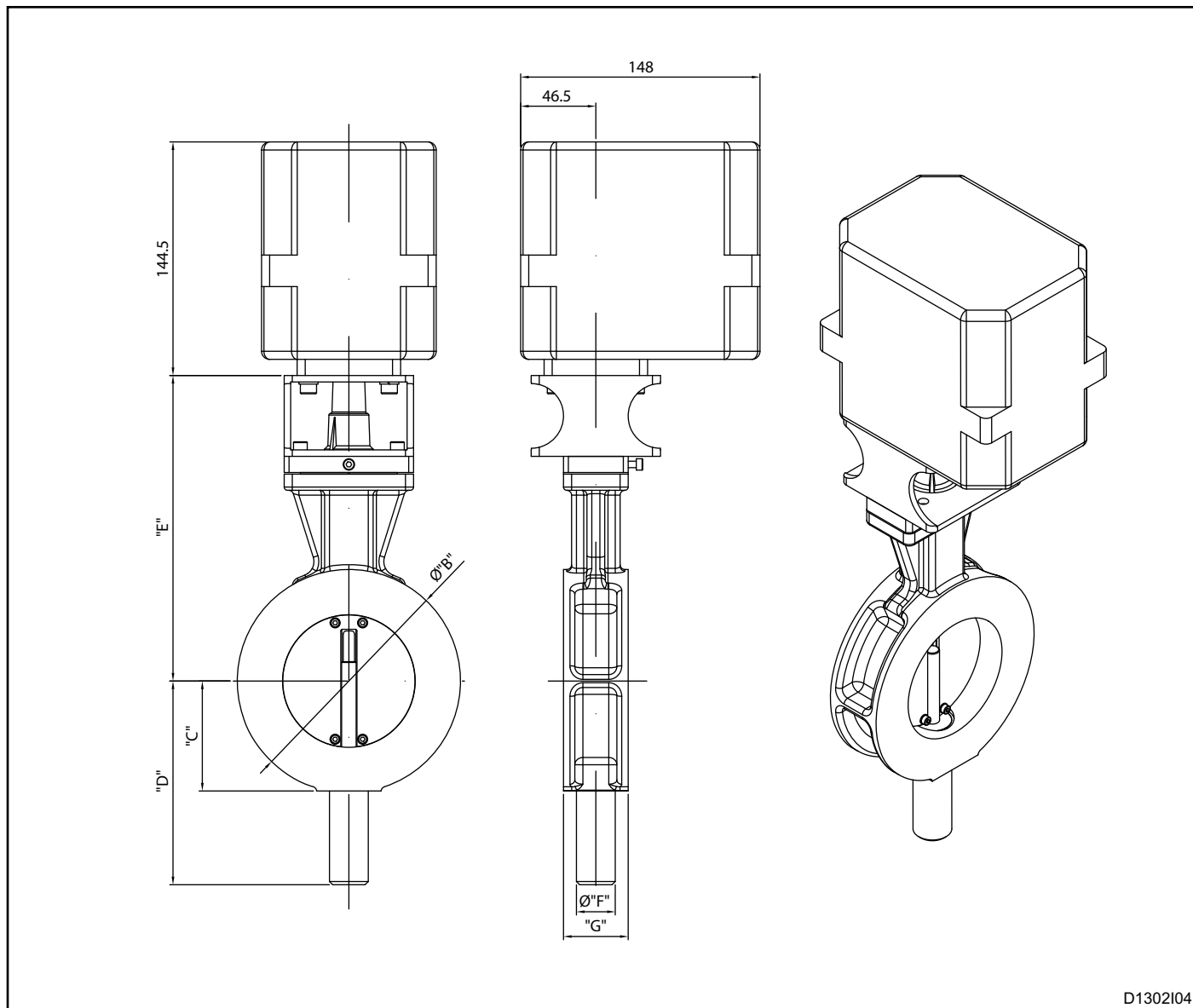
4 - Unscrew the fixing screws of the motor unit baseplate and remove it.

5 - Fix the new motor unit onto the support plate, reconnect the jointed lever (**pos. 01**) from the pivot on the motor unit (**pos. 06**) paying attention not to erroneously place the butterfly opening indicator.

6 - Put the conductors back into the motor unit case and connect them to the clamp referring to the wiring diagram.

7 - Make sure that the commands sent by the control system are carried out by the motor unit and that the feedback position and auxiliary switch signals send the control system correct indications. If necessary repeat all the steps indicated in the "REGULATION AND SETTINGS" section.

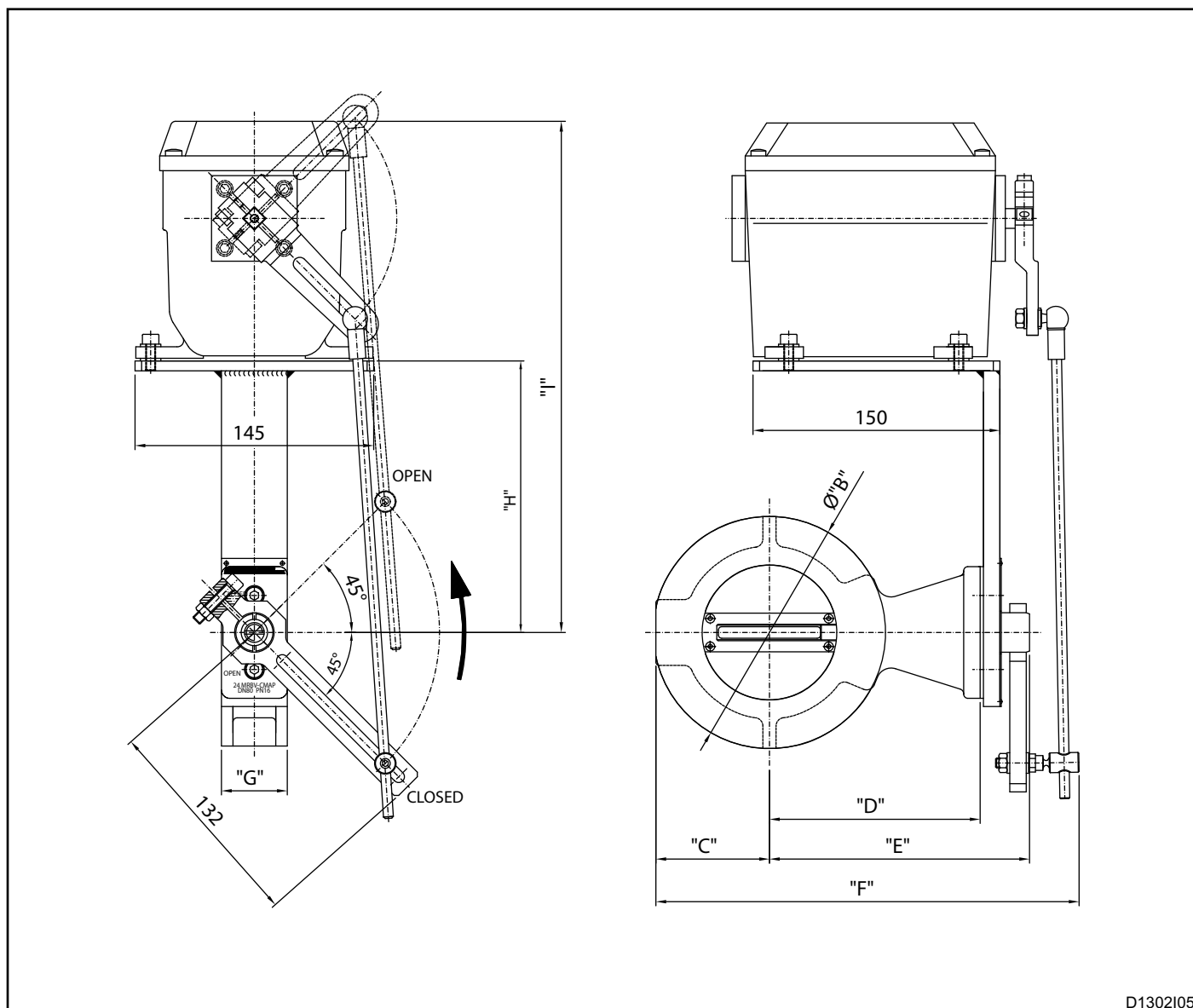
OVERALL DIMENSIONS - MRBV



D1302I04

Model	DN	ø "B" [mm]	ø "C" [mm]	ø "D" [mm]	ø "E" [mm]	ø "F" [mm]	ø "G" [mm]	Mass Kg
20MRBV	65	122	60	104	169	24	40	4.6
24MRBV	80	138	68	126	189	24	40	5.1
32MRBV	100	158	81	150	199	28	46	6.6
48MRBV	150	212	110	210	219	32	54	9.9

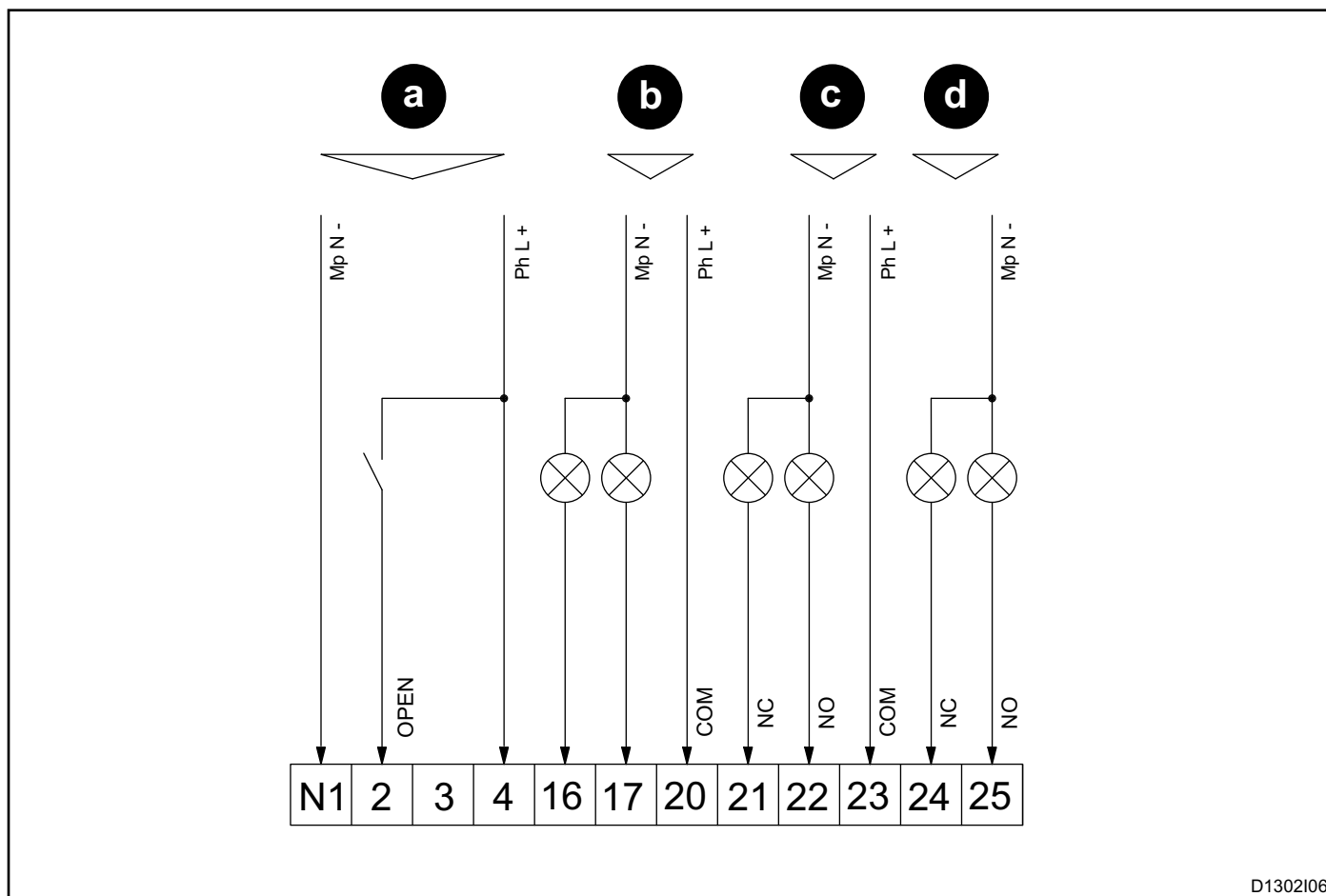
OVERALL DIMENSIONS - MRBV-CMAP



D1302I05

Model	DN	Ø"B" [mm]	"C" [mm]	"D" [mm]	"E" [mm]	"F" [mm]	"G" [mm]	"H" [mm]	"I" [mm]	Mass Kg
20MRBV-CMAP	65	122	60	108	138	229	40	165	311	5.2
24MRBV-CMAP	80	138	68	128	158	257	40	165	311	6.5
32MRBV-CMAP	100	158	81	138	168	198	46	255	400	7.5
48MRBV-CMAP	150	212	110	158	216	218	54	255	400	11.0

ELECTRIC CONNECTIONS - MOTOR UNIT ECON-V (MRBV)



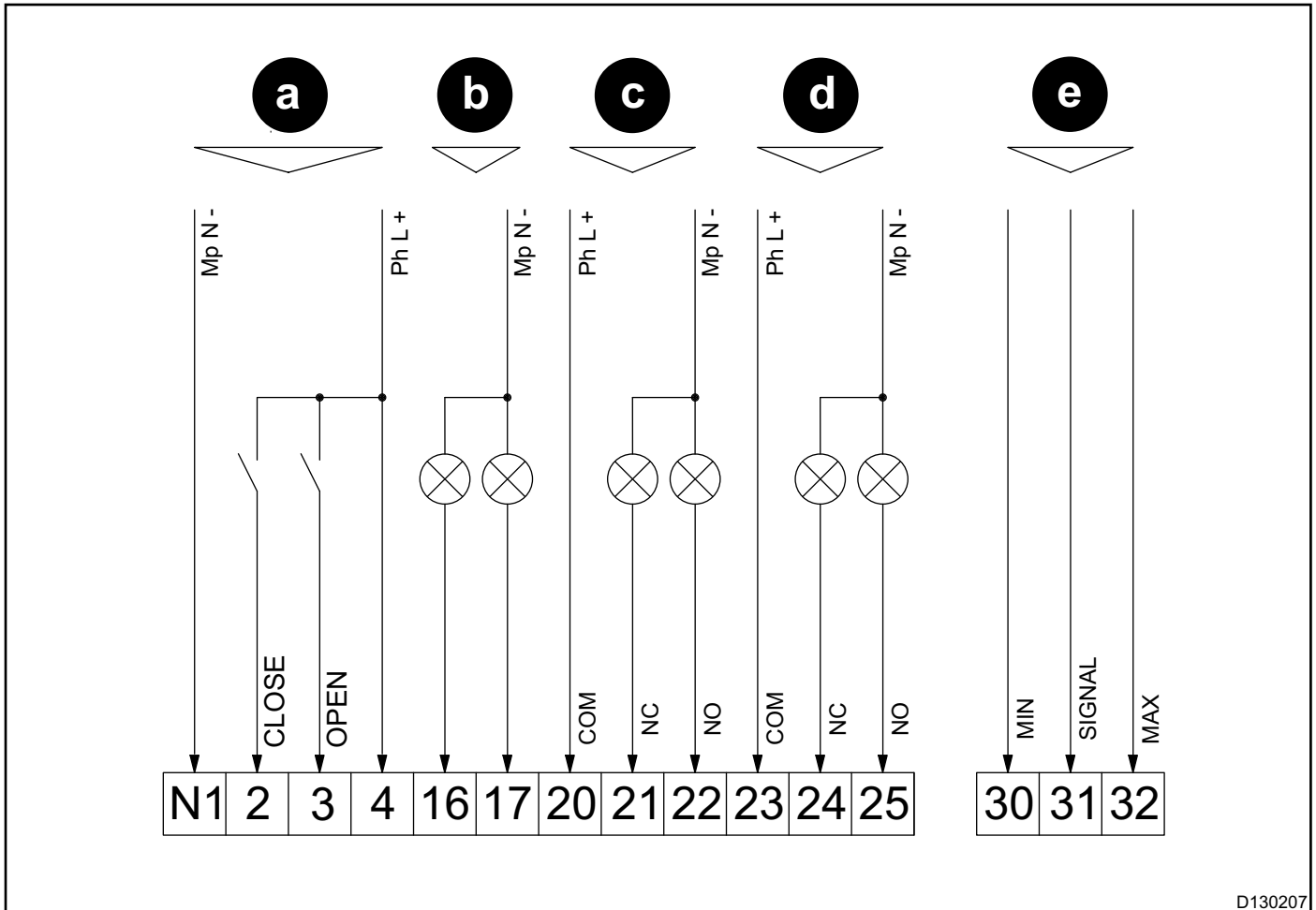
Pos.	Description	Pos.	Description
a	Power feed and rotation commands	c	S3 auxiliary switch outputs *
b	Outputs for position limit reached	d	S4 auxiliary switch outputs *

CLAMP CONNECTOR

Pos.	Description	Pos.	Description
N1	Neutral feeding	20	Auxiliary switch output S3 (COM)*
2	Opening command input (phase)	21	Auxiliary switch output S3 (NC)*
3	Not connected	22	Auxiliary switch output S3 (NO)*
4	Power feed phase	23	Auxiliary switch output S4 (COM)*
16	Output for max. opening reached (phase)	24	Auxiliary switch output S4 (NC)*
17	Output for min. opening reached (fase)	25	Auxiliary switch output S4 (NO)*

* Optional

ELECTRIC CONNECTIONS - OPEN/CLOSE MOTOR UNIT ECON-O (MRBV-CMAP)



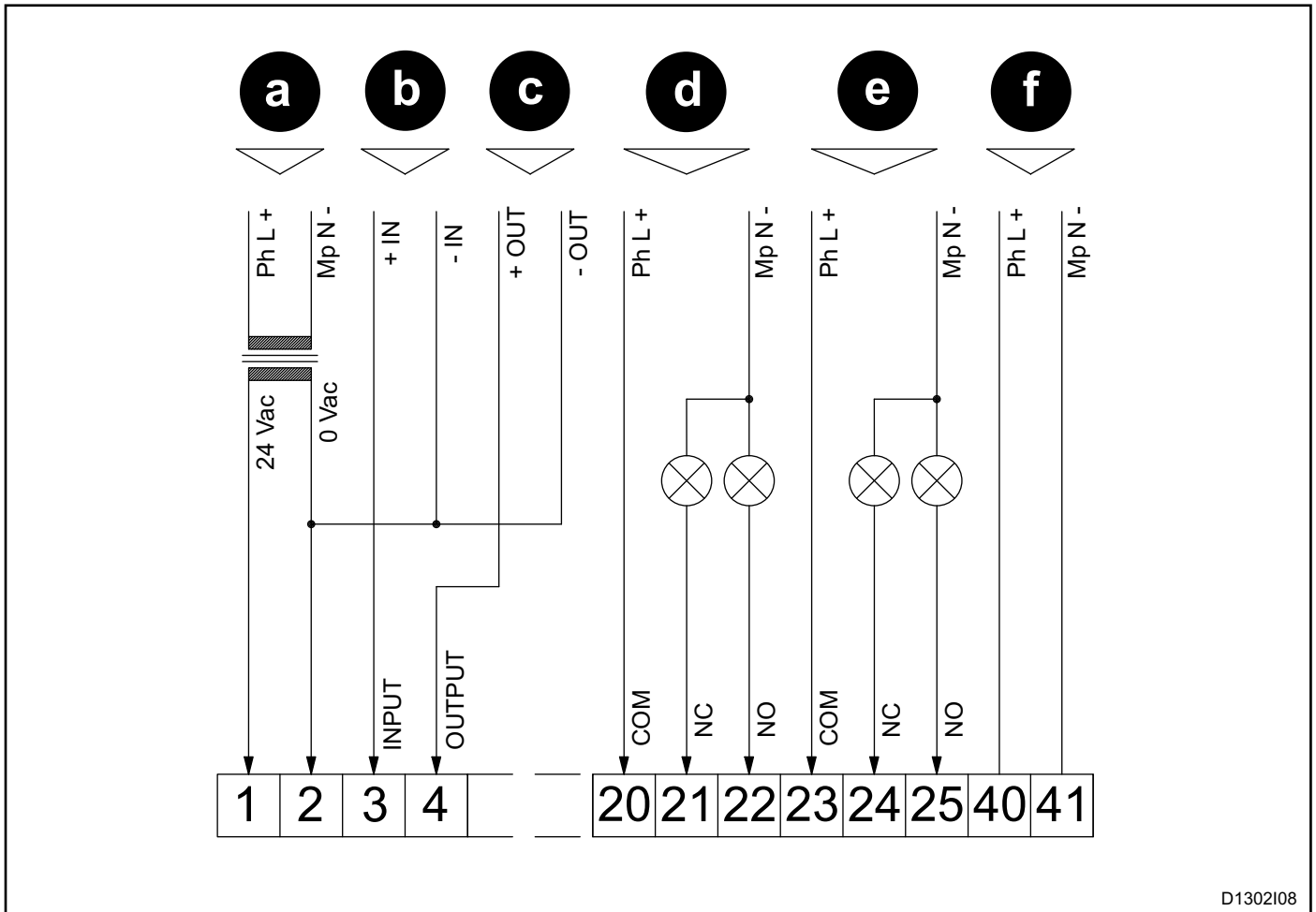
D130207

Pos.	Description	Pos.	Description
a	Power feed and rotation commands	d	S4 auxiliary switch outputs
b	Outputs for position limit reached	e	Potentiometer feedback position outputs
c	Auxiliary switch output S3		

CLAMP CONNECTOR

Pos.	Description	Pos.	Description
N1	Neutral feeding	22	Auxiliary switch output S3 (NO)
2	Closing command input (phase)	23	Auxiliary switch output S4 (COM)
3	Opening command input (phase)	24	Auxiliary switch output S4 (NC)
4	Power feed phase	25	Auxiliary switch output S4 (NO)
16	Output for max. opening reached (phase)	30	Potentiometer feedback output (Minimum)
17	Output for min. opening reached (fase)	31	Potentiometer feedback output (Cursor)
20	S3 (COM) auxiliary switch output	32	Potentiometer feedback output (Maximum)
21	S3 (NC) auxiliary switch output		

ELECTRIC CONNECTIONS - PROPORTIONAL MOTOR UNIT ECON-O (MRBV-CMAP)



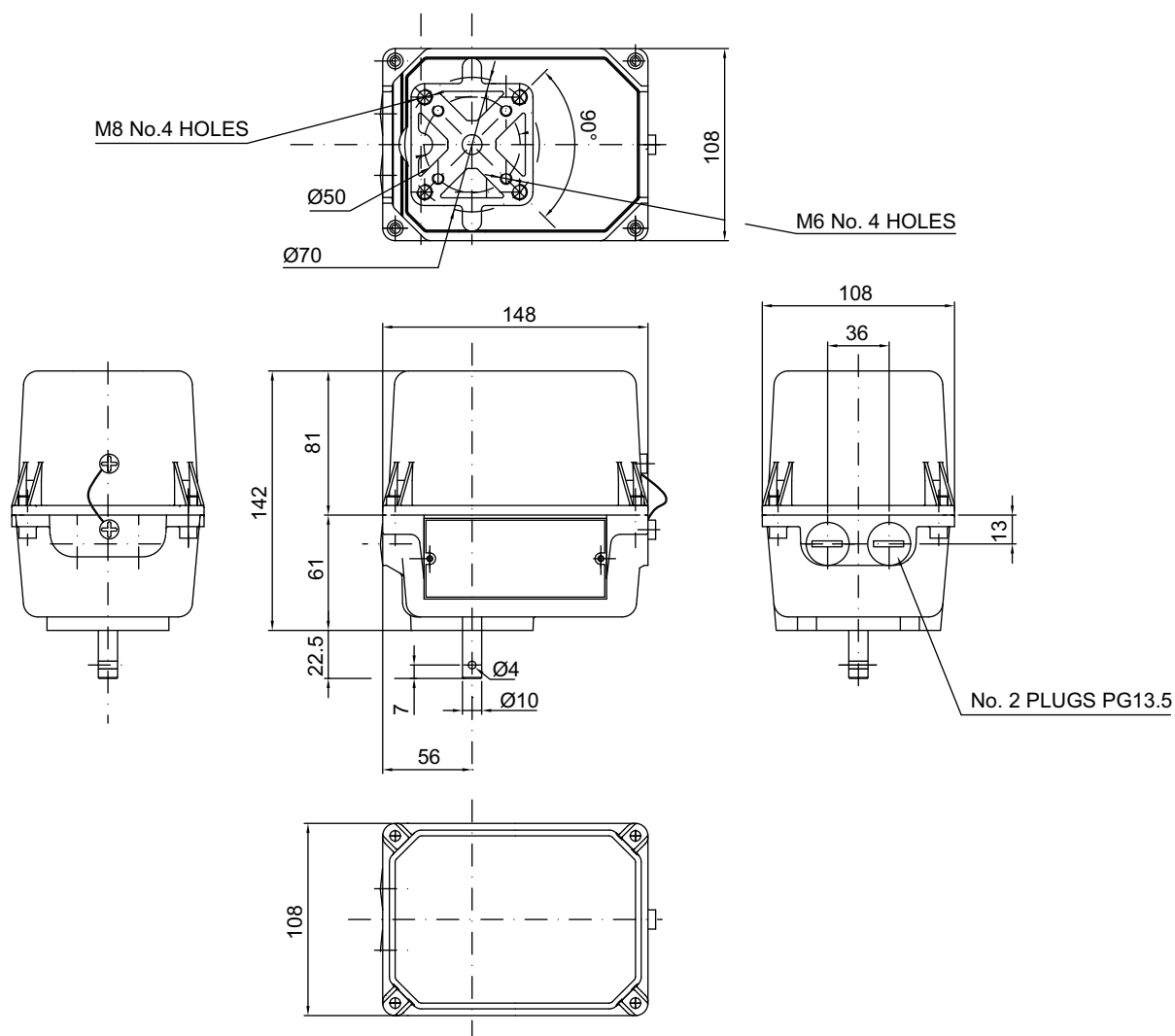
D1302108

Pos.	Description	Pos.	Description
a	Power 24Vac	d	S3 Auxiliary limit switch output
b	Analogical comand signal	e	S4 Auxiliary limit switch output
c	Analogical reverse action signal	f	Power feed of optional internal transformer

CONNECTING CLAMPS

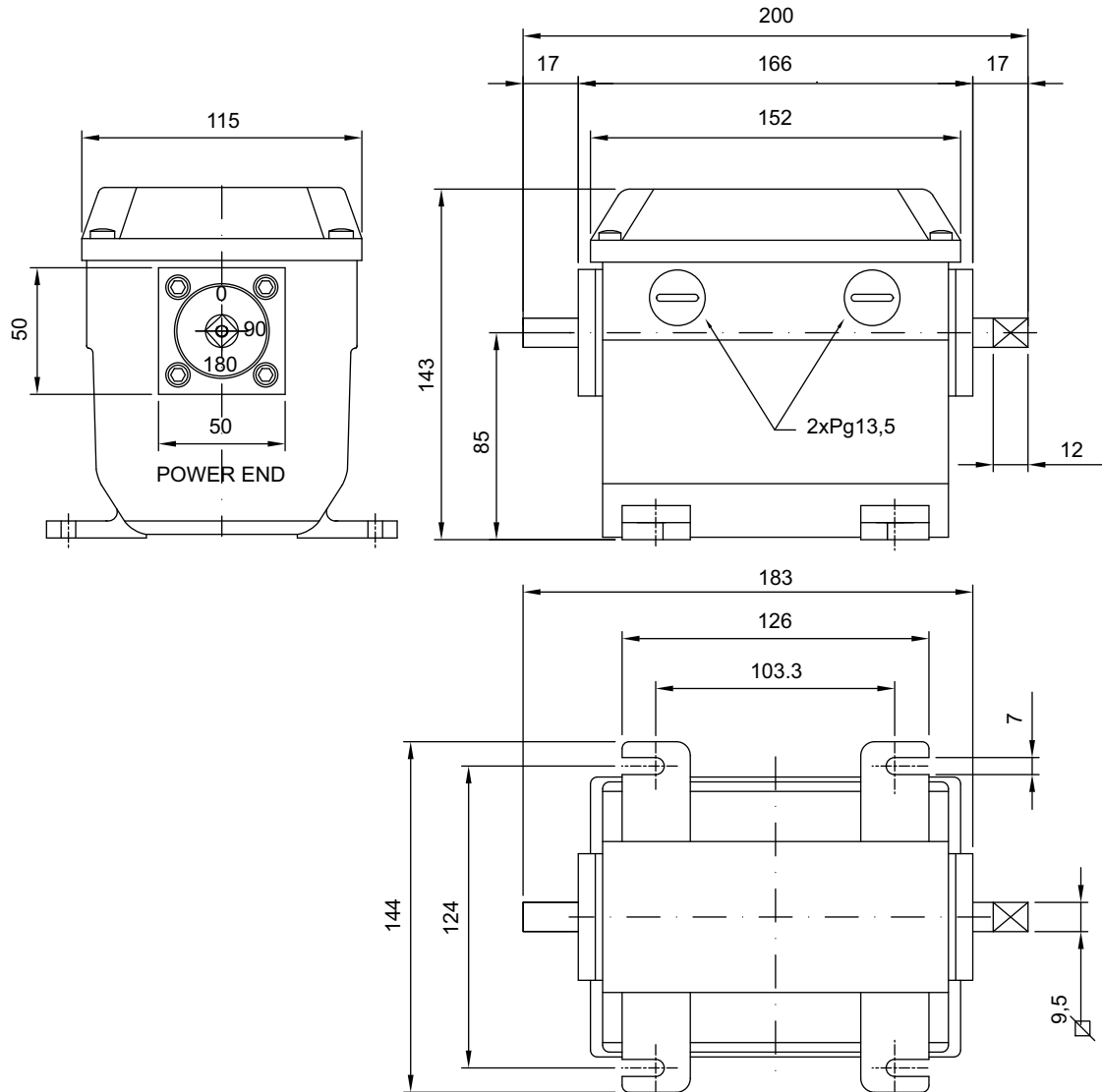
Pos.	Description	Pos.	Description
1	Power inlet of 24Vac	22	Auxiliary limit switch output S3 (NO)
2	0Vac power feed inlet, negative analogical comand signal and negative reverse action analogical comand.	23	Auxiliary limit switch output S4 (COM)
3	Positive analogical comand signal inlet	24	Auxiliary limit switch output S4 (NC)
4	Positive reverse action analogical comand outlet	25	Auxiliary limit switch output S4 (NO)
20	Auxiliary limit switch output S3 (COM)	40	Power feed phase of optional internal transformer
21	Auxiliary limit switch output S3 (NC)	41	Neutral of optional internal transformer

OVERALL DIMENSIONS - MOTOR UNIT ECON-V (MRBV)



D1302I09

OVERALL DIMENSIONS - MOTOR UNIT ECON-O (MRBV-CMAP)



D1302I10

ORDER CODE - MRBV

 - MRBV - -
01 02 03

Model		01
DN65	20	
DN80	24	
DN100	32	
DN150	48	

02	Voltage	
	24 Vac +10 -15%	24
	115 Vac +10 -15%	115
	230 Vac +10 -15%	230

03	Optional limit switch	
	Not installed	/
	Present	S

ORDER CODE - MRBV-CMAP

 - MRBV - CMAP - -
01 02 03

Model		01
DN65	20	
DN80	24	
DN100	32	
DN150	48	

02	Motor unit voltage feed	
	24Vac 50÷60Hz	24V
	115Vac 50÷60Hz	115V
	230Vac 50÷60Hz	230V

03	(*)Command type Proportional (only 24V)	
	In current	4-20mA
	In voltage	0-10V

(*) Not applicable for models with open/close command