



UNIVERSITY "POLITEHNICA" of BUCHAREST

DEMONSTRATIVE PNEUMATIC STAND

BIBUS TECHNOLOGIES

Prof. Coordinator

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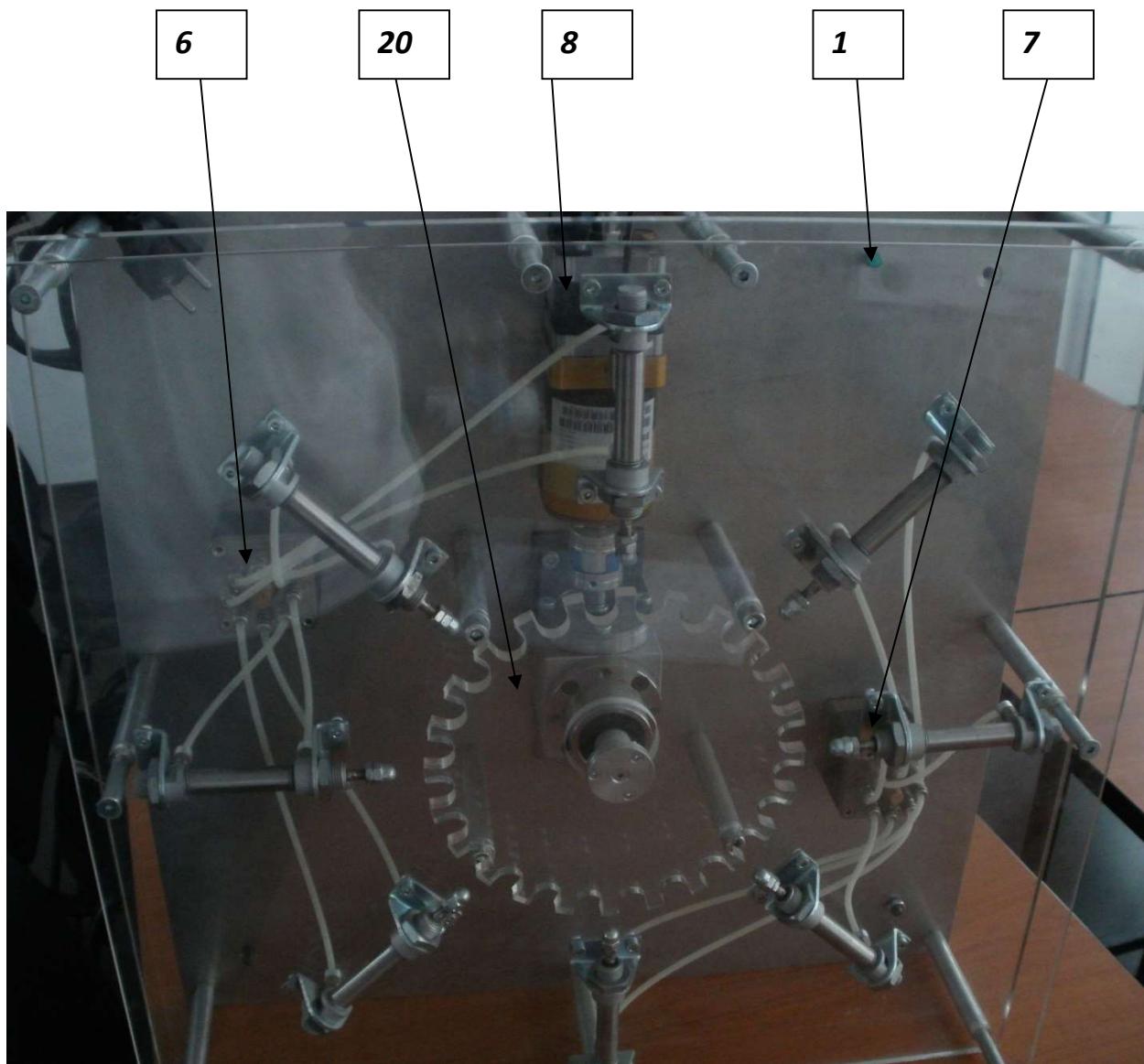
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- I. General view and description of machine functionalities
- II. Technical data and parts specifications
- III. Aspects of automatization
- IV. Detailed presentation of the equipment

I. General view and description of machine functionalities

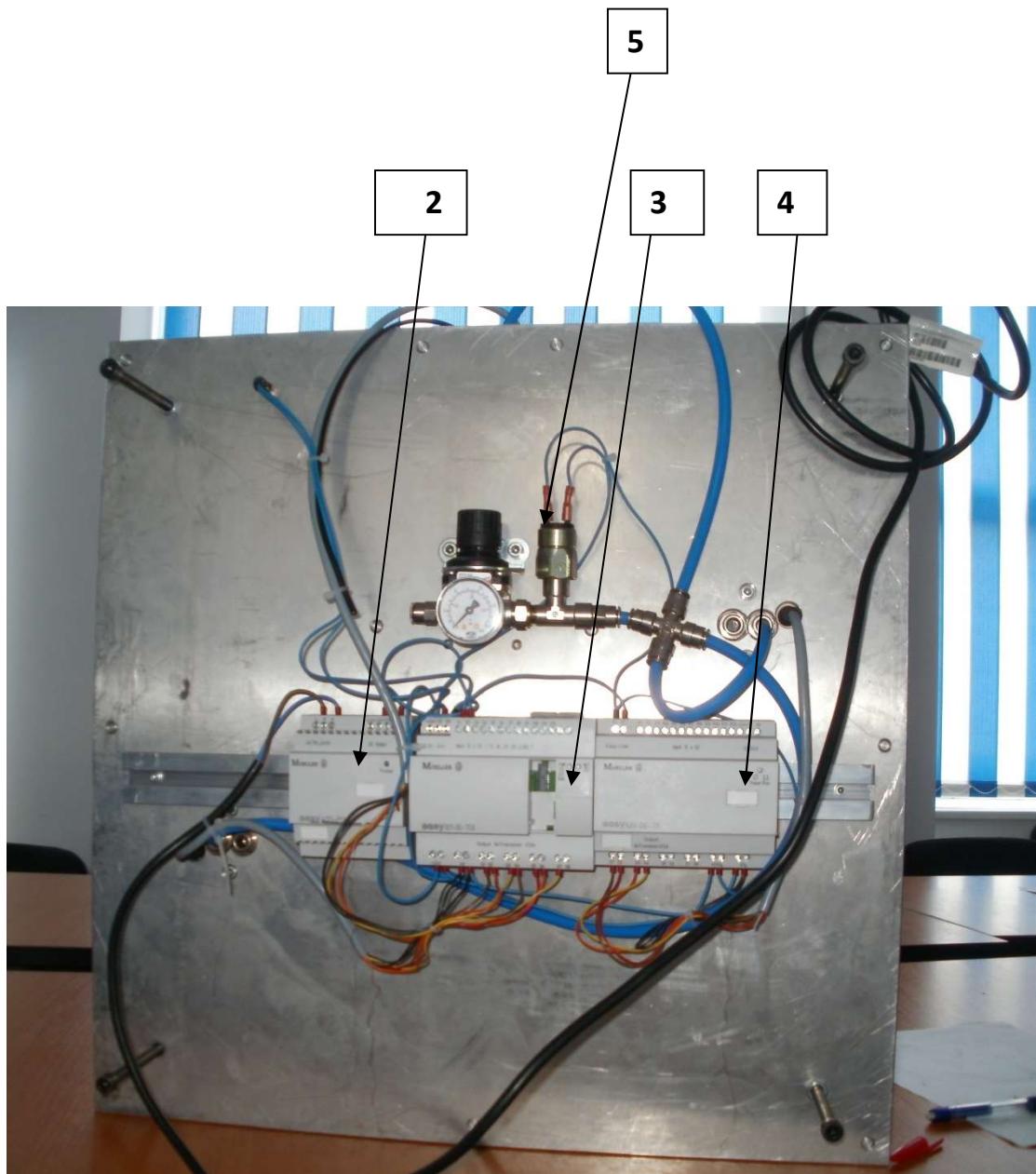
This is a demonstrative equipment made for gaining access to data in coordinate movement of the stepper motor, transmission and pneumatic pistons.

The stand it's activated by the green button (1).



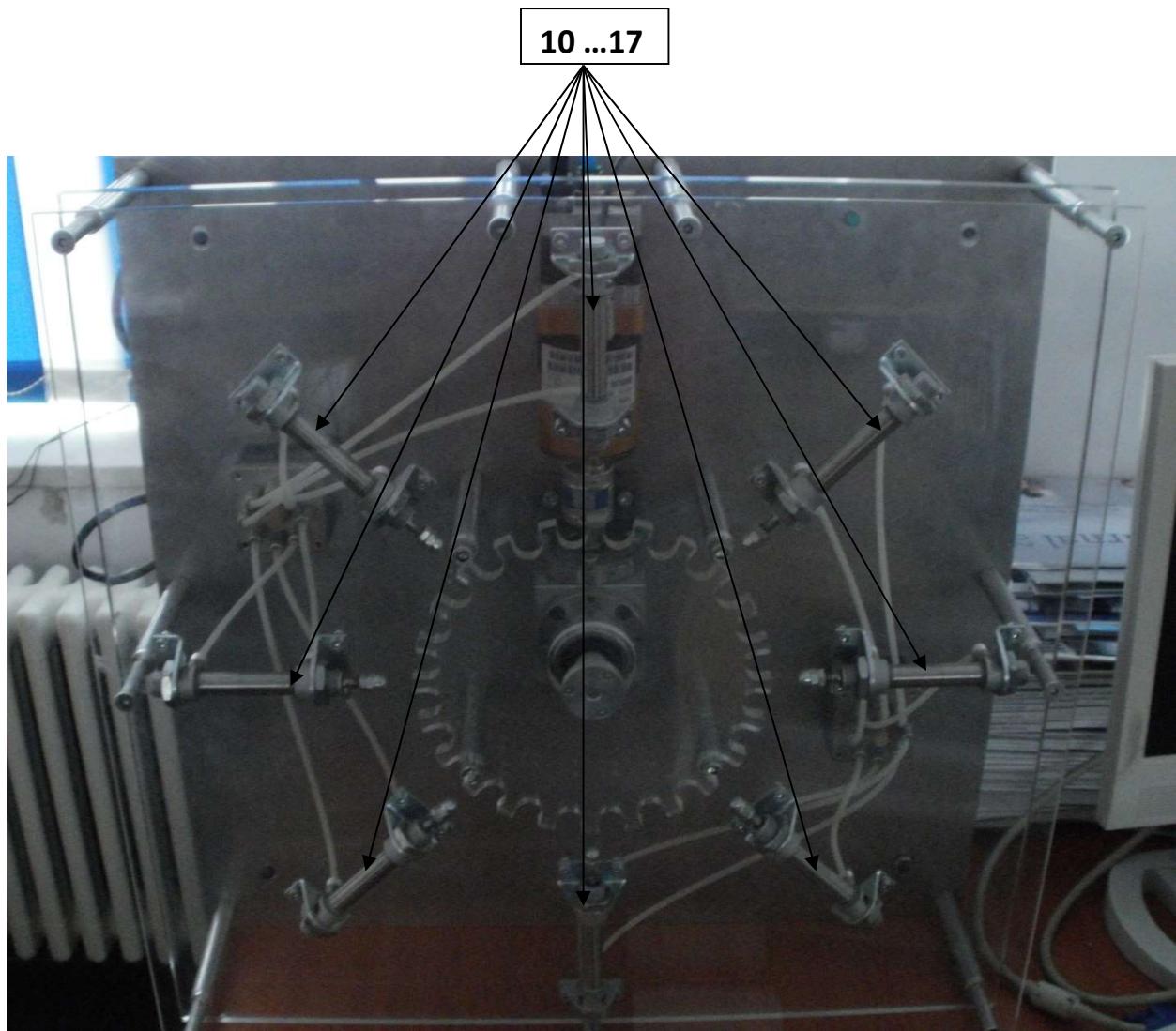
F.1- Pneumatic stand – Front view

The device is powered by a Moeller 400POW (2) power source. The data is converted and is directed by a Moeller3- EASY621-DC-TC (3) in module and a Moeller 2- EASY821-DC-TCX (4) out module, which generates signals to the pneumatic sensor (5), where the pressure is verified and the solenoid valves-matrix (6), (7) and (8).



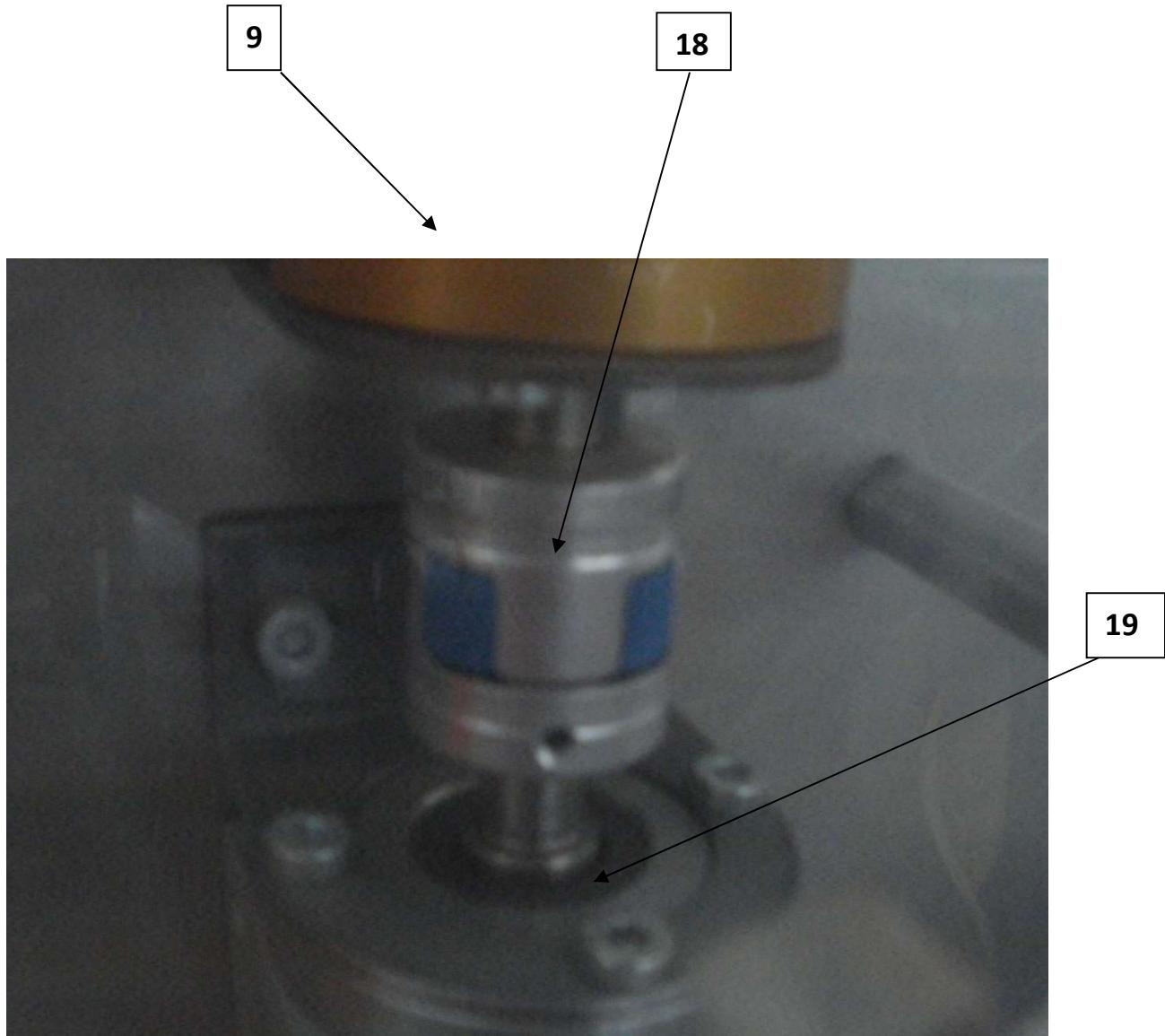
F. 2- Pneumatic stand – Rear view

Valves (6) and (7) perform concomitant pneumatic control that generates the linear motions of pistons (10) to (17).



F.3

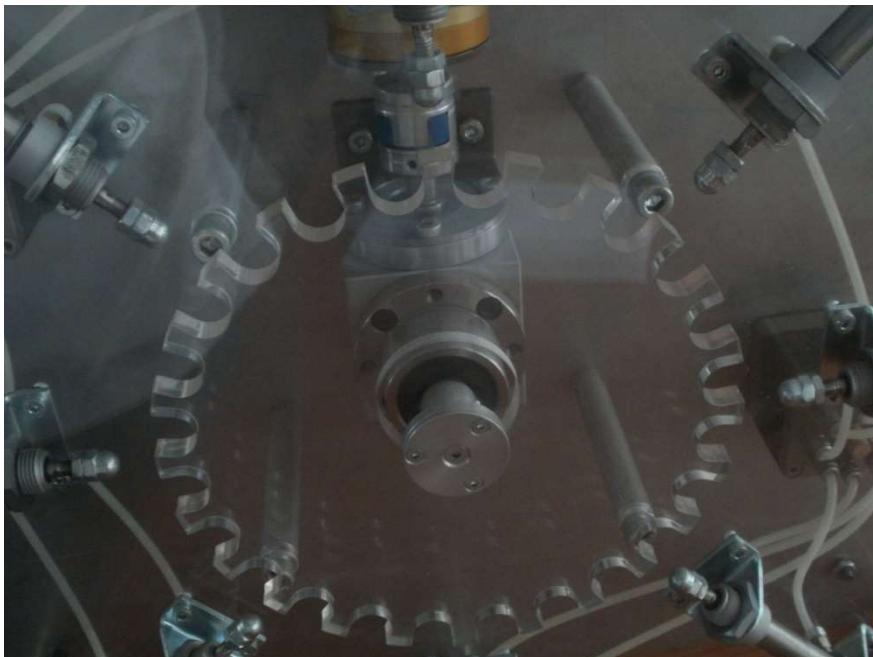
Another solenoid valve is used to control the stepper motor (9), which is connected to a flexible coupling (18) that engage the bevel gear (19).



F.4



The purpose of this equipment is to demonstrate the capability of every part to work at a maximum performance in cooperation with the others. In the image below are represented the motion parts of this machine: motor, coupling, bevel gear that changes the motion angle, plastic wheel and pneumatic pistons. To verify the all of the parts that work together the piston's heads should enter between the wheel's teeth without touching them.

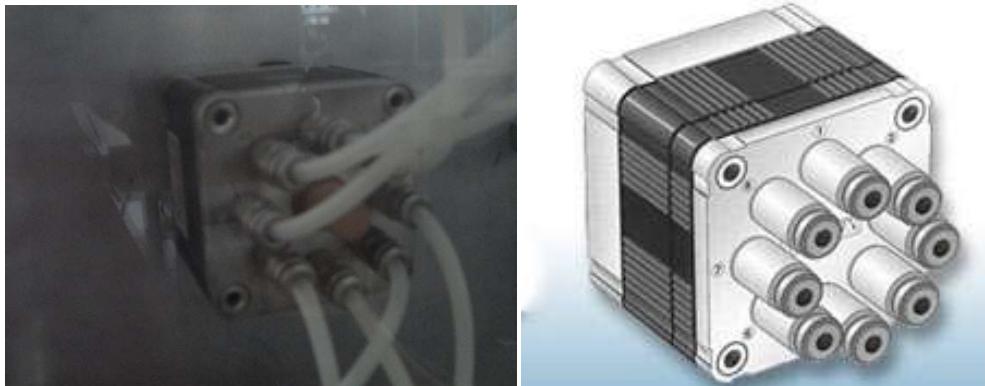


F.5- Motion parts



II. Technical data and parts specifications

Solenoid Valve Matrix 758

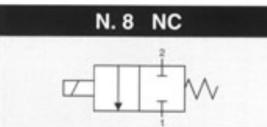


758 VACUUM • 2/2

NC | NO



CONTROL: DIRECT PFM PNM PWM



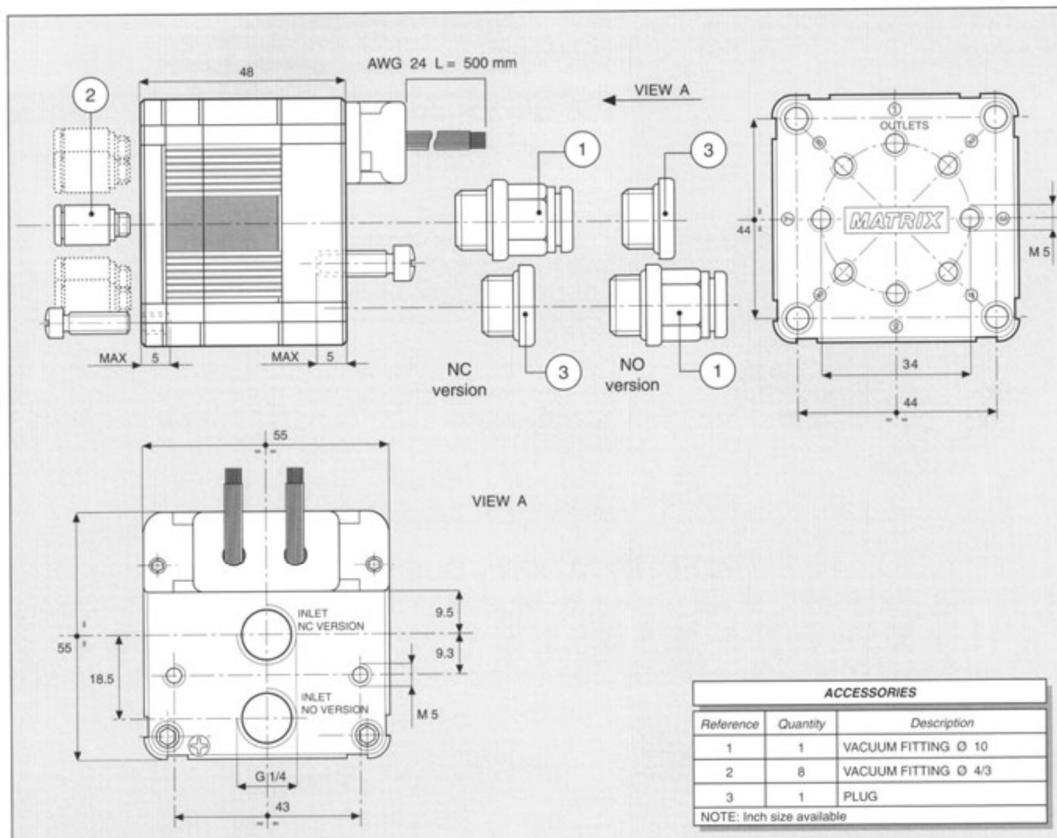
GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (-10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	- 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN OPENING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	350 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

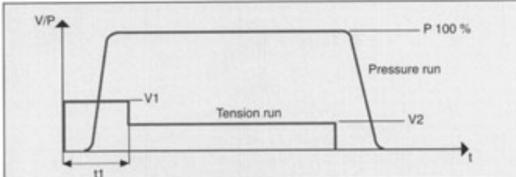


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758 VACUUM • 2/2



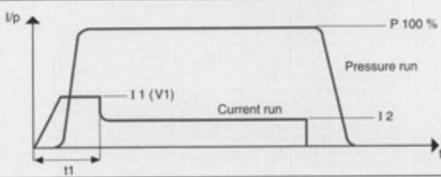
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V1 = 24 VDC t1 = 2 ms V2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I1 = 0.7 A t1 = 2 ms I2 = 0.3 A

ELECTRICAL PORT CONNECTION

COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8

Motor

BPS-1620-MX Stepping motor with 3.3 Nm, shaft end, key groove, spring and with Matr

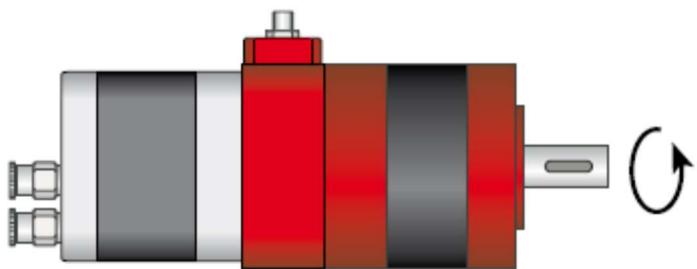
Product characteristics

- Compact motor / valve unit
- Up to 10 Nm torque
- Protection class: IP 55

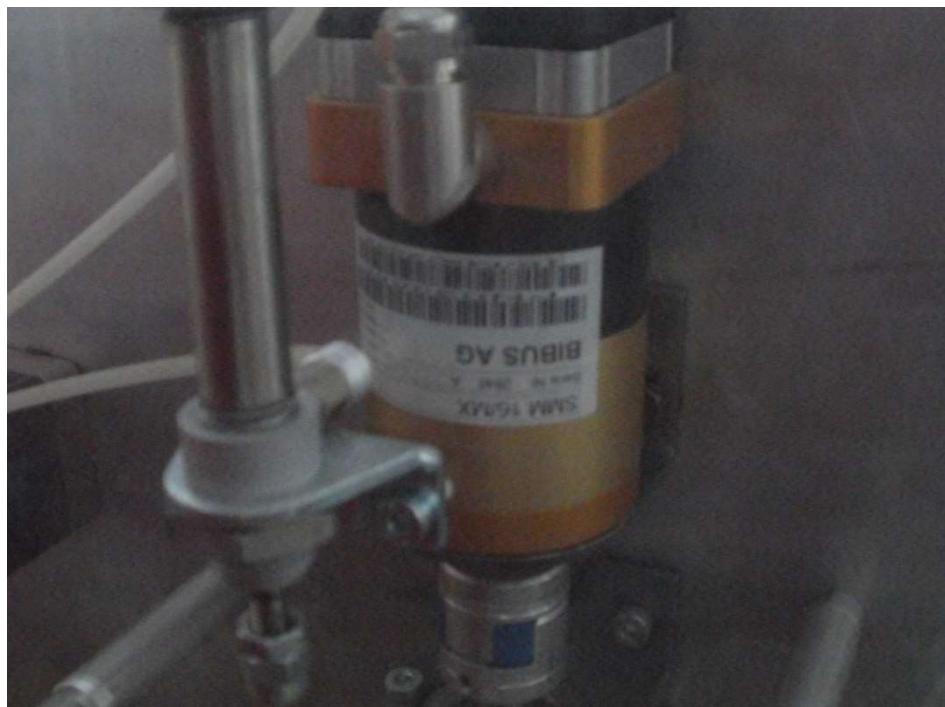
Technical Information

The pneumatic stepper motor offers several advantages over electric versions. High torques is achieved even with small dimensions and without a reduction gear thanks to the pneumatic drive. All pneumatic stepper motors are equipped with internal braking – with no step loss – in case of a power failure. This is a decisive advantage particularly for sensitive applications. The flange-mounted valve provides for a very compact unit without additional hose connections. These pneumatic stepper motors are used wherever precision under difficult conditions is demanded. In dusty or dirty environments or in the presence of strong magnetic fields as well the pneumatic stepper motor really shows its strengths. The motor features versatile and simple control and there is a suitable type for every application, e.g. classic with an output shaft or with a spindle for linear motions.

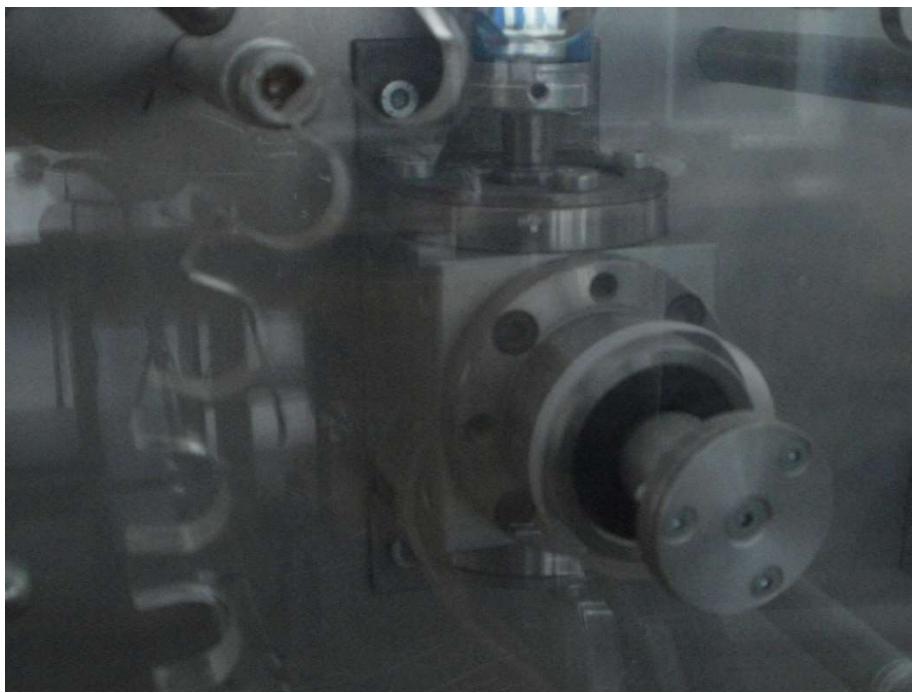
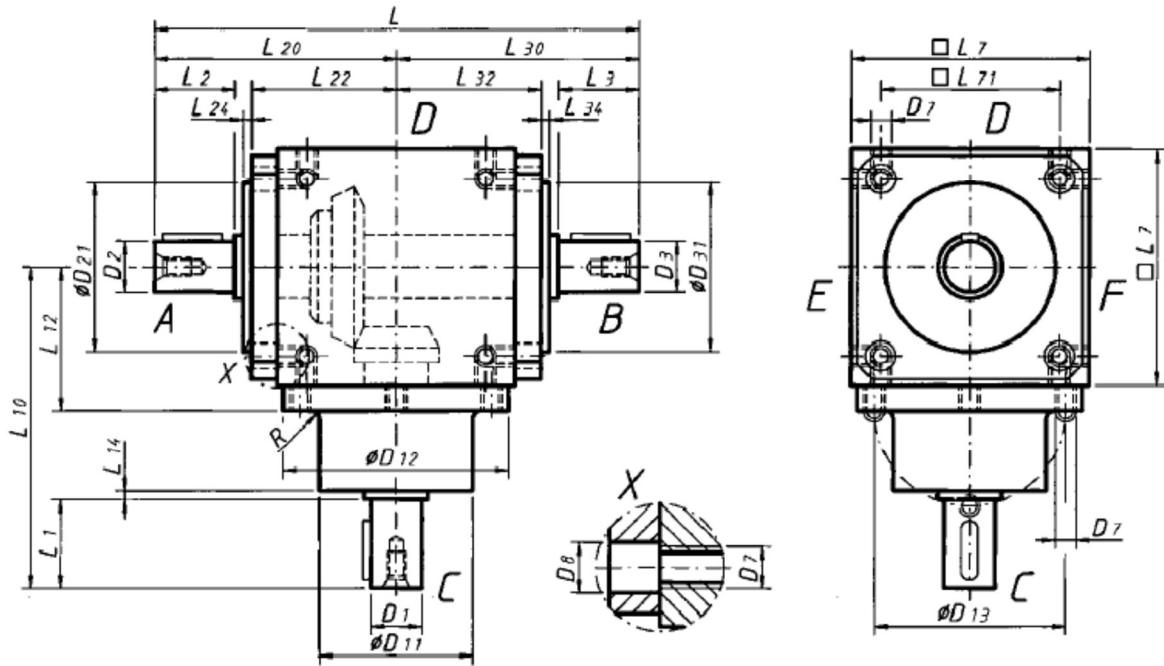
With control valve



Type BPS MX
incl. control valve



Bevel gear



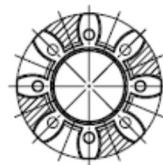
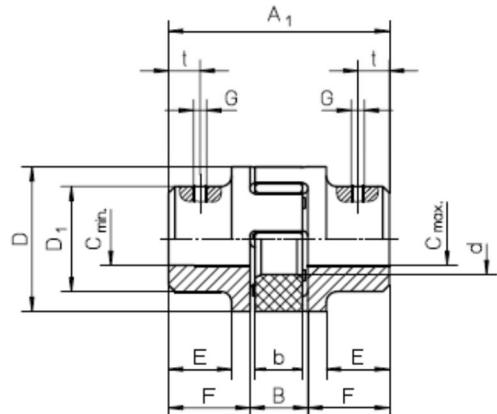


Flexible couplings RA, RG

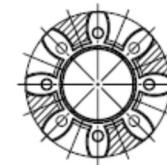
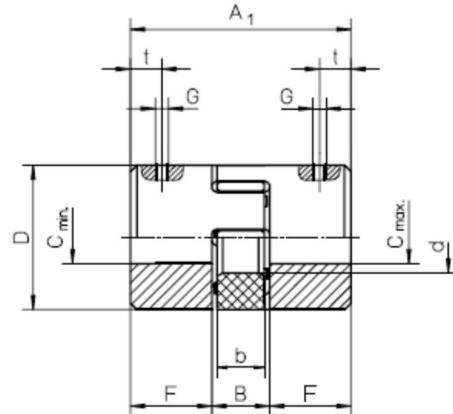


Flexible couplings transmit the torque by positive locking, and compensate for slight nonalignment, stagger and offset of shafts.
Standard toothed ring 92 Shore A.

Version 1

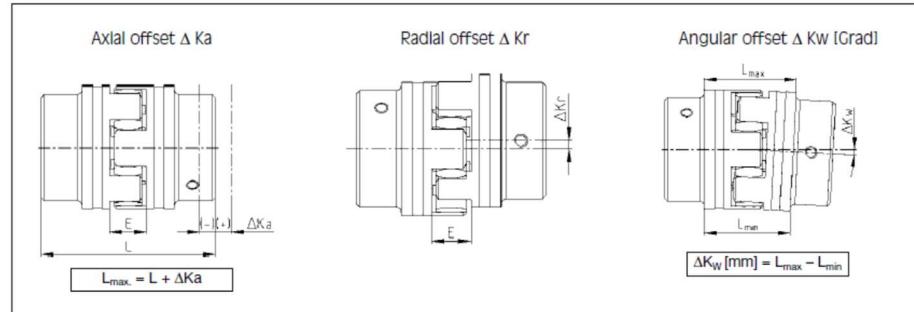


Version 1a

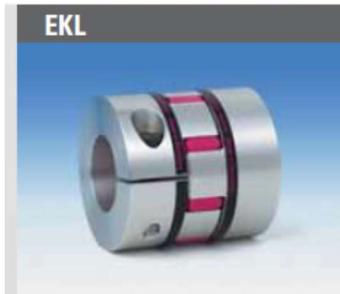


Offsets

In the case of the standard and large hubs RA 14-48, the tapped hole G for the locking screw is located opposite the groove. Locking screws according to DIN 916 with toothed washer.

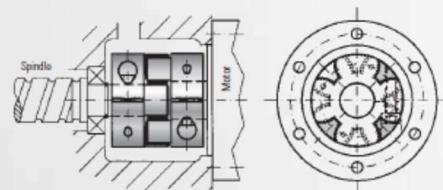


EKL



with clamping hub,
compact version

- short compact design
- low inertia
- easy assembly



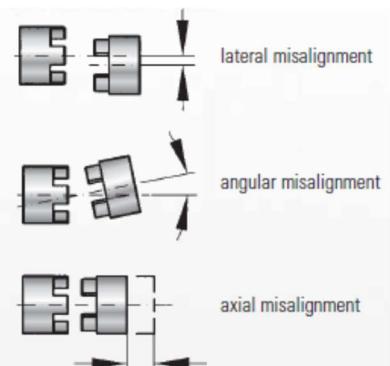
see page 5

Areas of application:

- Servo drives
- Machine tools
- Packaging machinery
- Plant automation
- Printing machinery
- Industrial robots
- Measurement and positioning units
- general mechanical engineering
- Linking screw jacks, linear actuators, encoders

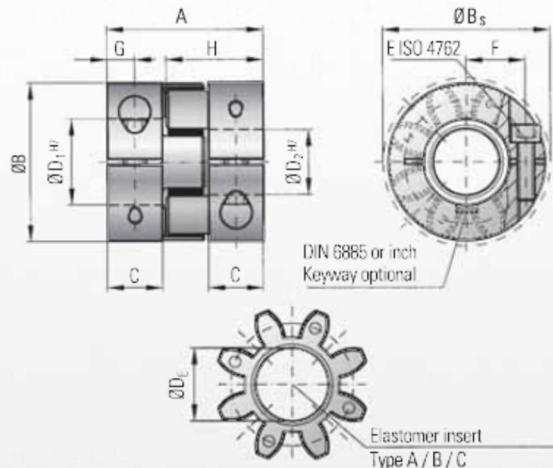
Properties of the product range:

- vibration dampening
- electrically insulating (standard)
- backlash-free
- press-fit design
- compensation of lateral-, angular- and axial misalignment



MODEL EKL

TECHNICAL SPECIFICATIONS



Properties:

- short compact design
- easy assembly
- vibration dampening
- electrically insulating
- backlash-free
- press-fit design

Material:

Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design:

Two coupling hubs are concentrically machined with concave driving jaws

*Speeds:

Over 4.000 rpm a finely balanced version is available

Tolerance:

On the hub/shaft connection 0,01 to 0,05 mm

Compact version





Model EKL		10		
Type (Elastomer insert)		A	M	C
Rated torque (Nm)	T_{KN}	12,5	16	4
Max. torque** (Nm)	T_{Kmax}	25	32	6
Overall length (mm)	A	32		
Outer diameter (mm)	B	32		
Outer diameter with screwhead (mm)	B _S	32		
Mounting length (mm)	C	10,3		
Inner diameter range H7 (mm)	D _{1/2}	4 - 16		
Inner diameter max. (elastomer) (mm)	D _E	14,2		
Mounting Screw (ISO 4762/12.9)		M4		
Tightening torque of the mounting screw (Nm)	E	4		
Distance between centers (mm)	F	10,5		
Distance (mm)	G	5		
Hub length (mm)	H	20,7		
Moment of inertia (10^3 kgm^2)	J _{1/J₂}	0,01		
Approx. weight (kg)		0,05		
Speed* (rpm)		20.000		



Moeller 1-EASY400-POW



Switched-mode power supply unit

Input voltage range: 85 to 264 V

Output voltage: AC 24 V DC +/- 3%

Output current, nominal value: 1.25 A

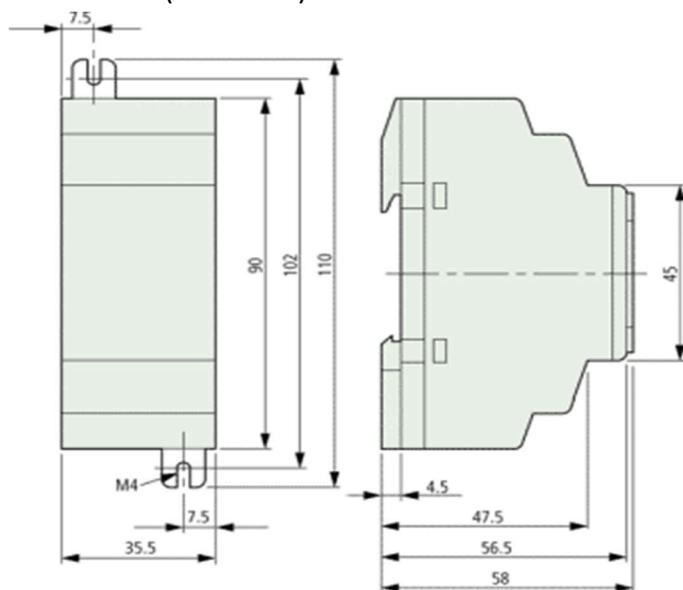
Overcurrent limitation from 1.4 A

Potential isolation, primary/secondary: Yes, SELV(to EN 60 0950, VDE 805)

Short-circuit proof (secondary): Yes

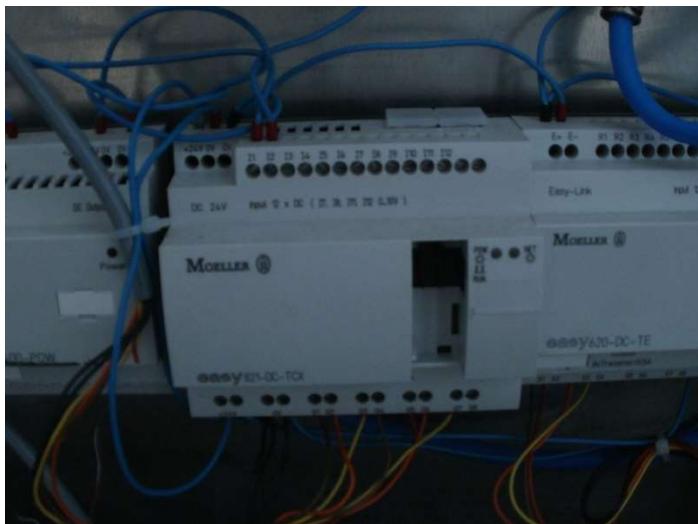
Overload protection (secondary): Yes

Dimensions (W x H x D) inches: 1.39 x 3.54 x 2.28 inches





Moeller 2- Easy 825-DC-TCX



Supply voltage: 24 VDC

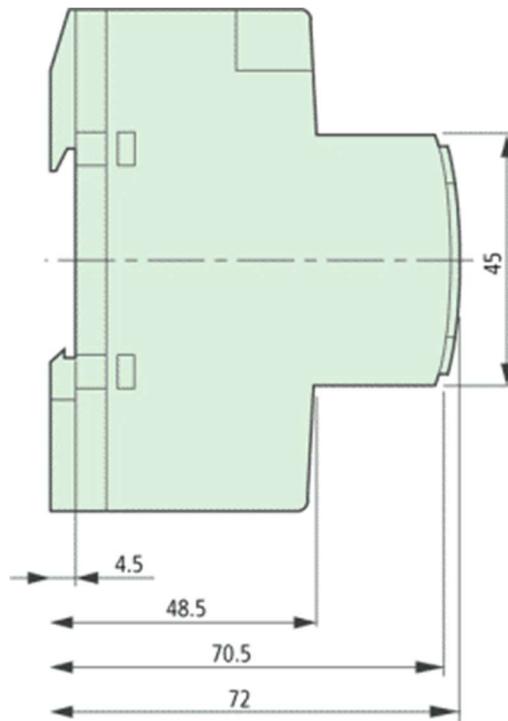
Power dissipation: 3.4 W

Inputs, digital: **12**

Inputs, analog, option (0–10 V): Up to **4** of the provided **12** inputs may be user assigned as analog inputs

Outputs: **8 Transistors**

Outputs, analog,(0–10 V): -





Moeller3- EASY621-DC-TC



Supply voltage: 24 VDC

Power dissipation: 4 W

Inputs, digital: **12**

Inputs, analog, option (0–10 V): *Up to 2 of the provided 12 inputs may be user assigned as analog inputs*

Outputs: 6 Relay

Outputs, analog, (0–10 V): Not Available

LC display, keypad/keypad EASY: Yes

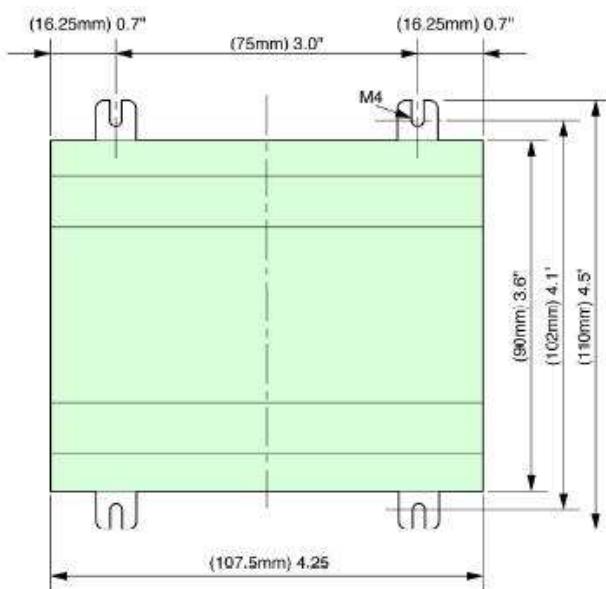
Week/Year clock: Yes/--

Output continuous current: 0.50 A

Short-circuit proof at cos phi = 1: Line protection B 16, 600 A

Short-circuit proof at cos phi = 0.7...0.7: Line protection B 16, 900 A

Dimensions in inches (W x H x D): 4 x 3.5 x 2.3 in.



M3A-ABS 40

Case: Black plastic

Transparent plastic

Quadrant: White plastic

Element gauges: Bourdon tube in copper alloy,
solder alloy of tin

- _ C 60 bar spring,

- _ 60 bar spring curl

Movement: Brass

Specifications

Reference standards: EN 837-1

Pressure: Static: 75% of full scale

Floating: 60% of full scale

For short periods: up to full scale

Temperature Limits: Ambient: -20 ... +60 ° C

Fluid: +60 ° C maximum

Storage: -20 ... +60 ° C

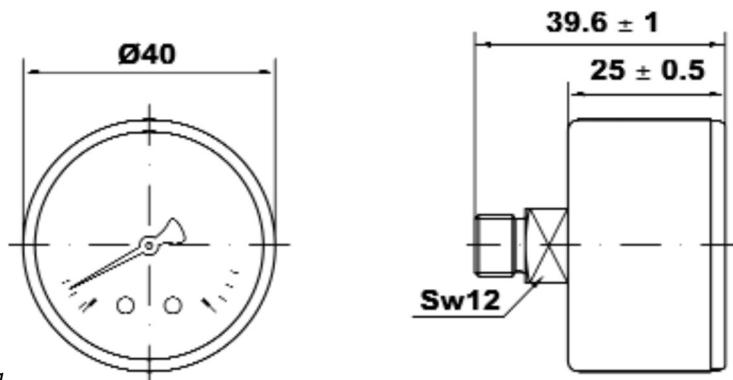
Thermal drift: $\pm 0.04\%$ / 1K compared to (+20 ° C)

Accuracy class: cl. 2.5, cl. 1.6 to request



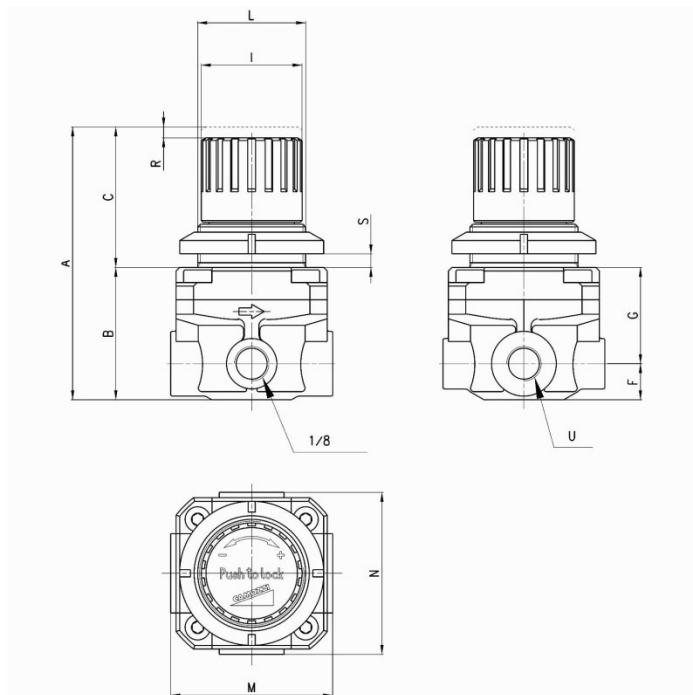


Degree of protection: IP 31 to EN 60 529 / IEC 529



Individual weight: 0,048 kg

M008-R00-VS





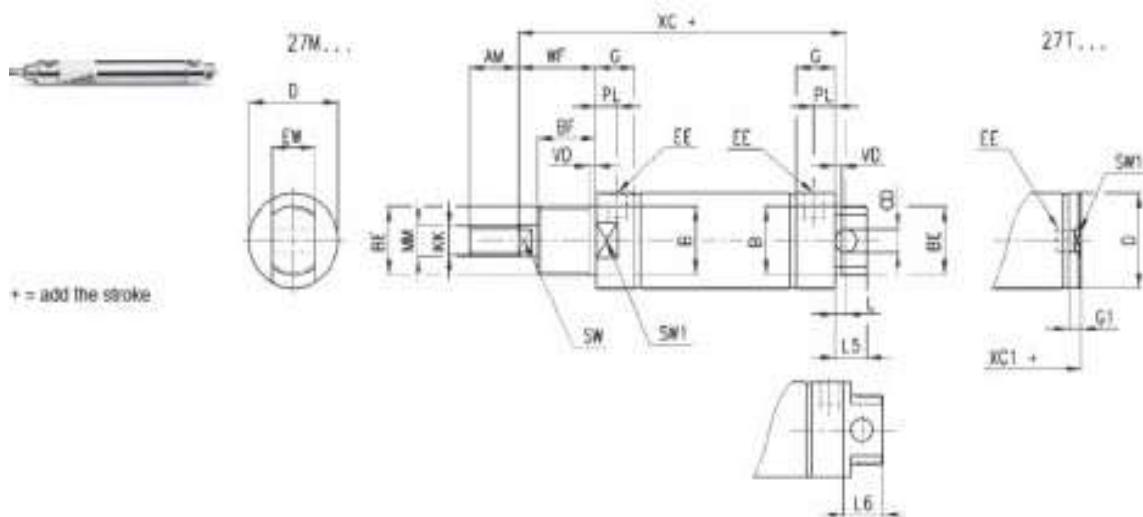
General characteristics

Constructive type With membrane
Materials body: steel INOX; O-ring:

NBR
Fitting G1/8 - G1/4
Weight Kg 0,235
Working Temperature-5°C ÷ 50°C
Entry pressure 0 ÷ 16 bar
Exit pressure 0,5 ÷ 10 bar



Cylinders Series 42





STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES 42

* = Double acting
■ = Single acting

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	■ ■	■ ■	■ ■	■	■	■	■	■	■	■	■	■	■	■
40	■ ■	■ ■	■ ■	■	■	■	■	■	■	■	■	■	■	■
50	■ ■	■ ■	■ ■	■	■	■	■	■	■	■	■	■	■	■
63	■ ■	■ ■	■ ■	■	■	■	■	■	■	■	■	■	■	■

CODING EXAMPLE

42	M	2	N	050	A	0200
42 SERIES						
M VERSION M= standard magnetic						
2 OPERATION 1 = single-acting (front spring) 2 = double-acting (front and rear cushions) 3 = double-acting (no cushion) 4 = double-acting (rear cushions) 5 = double-acting (front cushion) 6 = double-acting (through-rod with front and rear cushions) 7 = single-acting (through-rod)						
N MATERIALS N = rod stainless steel AISI 420B - tube stainless steel AISI 304 - NBR seals						
050 BORE 32 mm 40 mm 50 mm 63 mm						
A TYPE OF DESIGN A = standard (screw with ring V+ lock for rod U)						
0200 STROKE (see table)						



Foot mount Mod. B



Nose nut Mod. V



Piston

All accessories are supplied separately except for piston rod lock
nut Mod. U



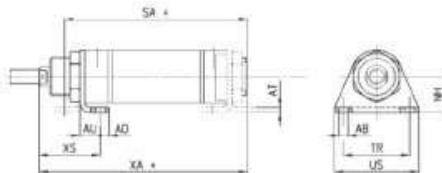
Foot mount Mod. B

Material: zinc-plated steel.

Supplied with:

1x foot

1x front end cap nut mod. V



+ = add the stroke

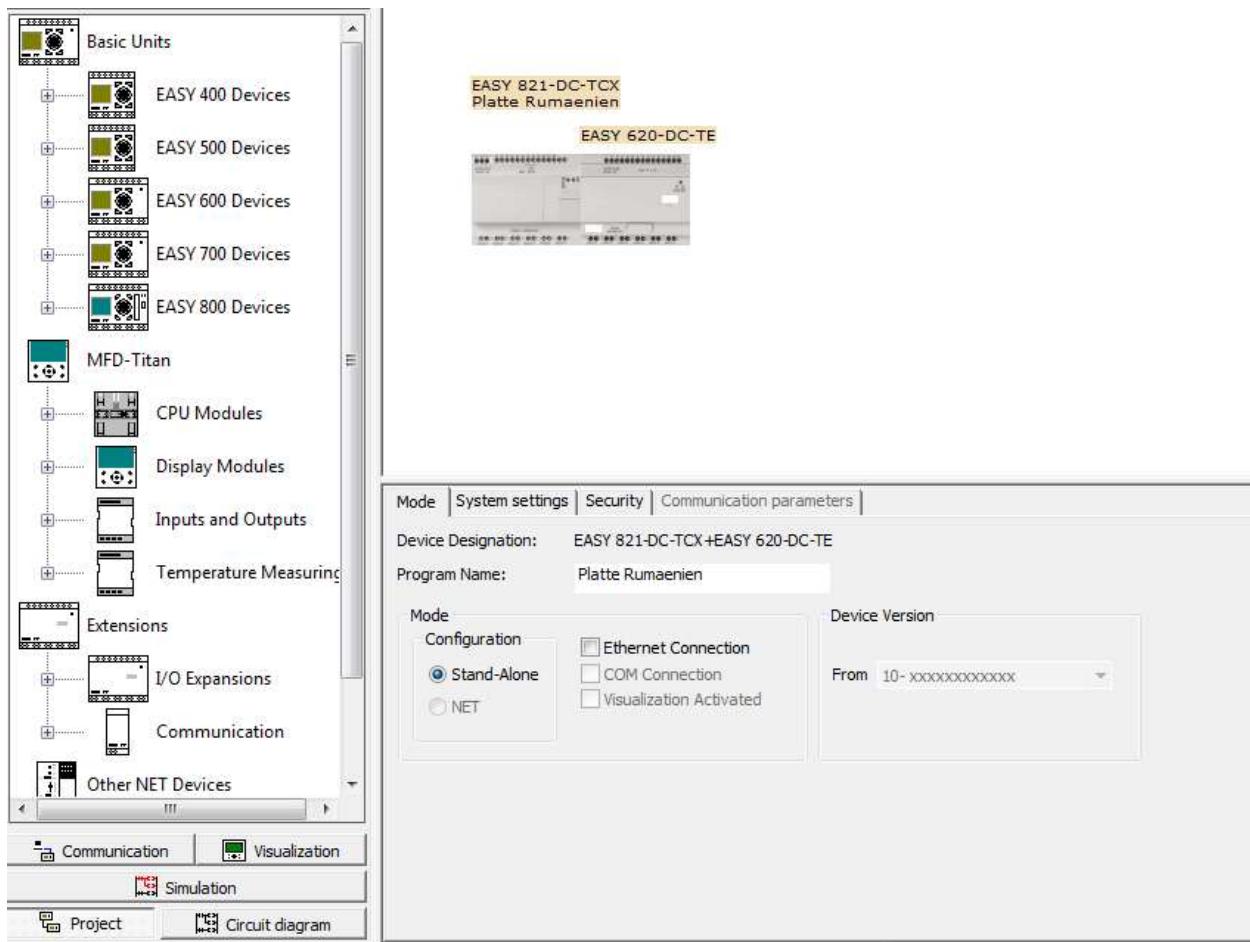
DIMENSIONS

Mod.	D	AB	AO	AT	AU	NH	SA+	TR	US	XA+	XS
B-27-20	20	5,5	6	3	13	20	79	32	42	83	27
B-27-25	25	6,6	8	3	12,5	22	78	38	49	82	26
B-27-32	32	6,6	8	4	16	26	96	40	54	102	35
B-27-40	40	7	7	4	16	28	99	52	66	107	36

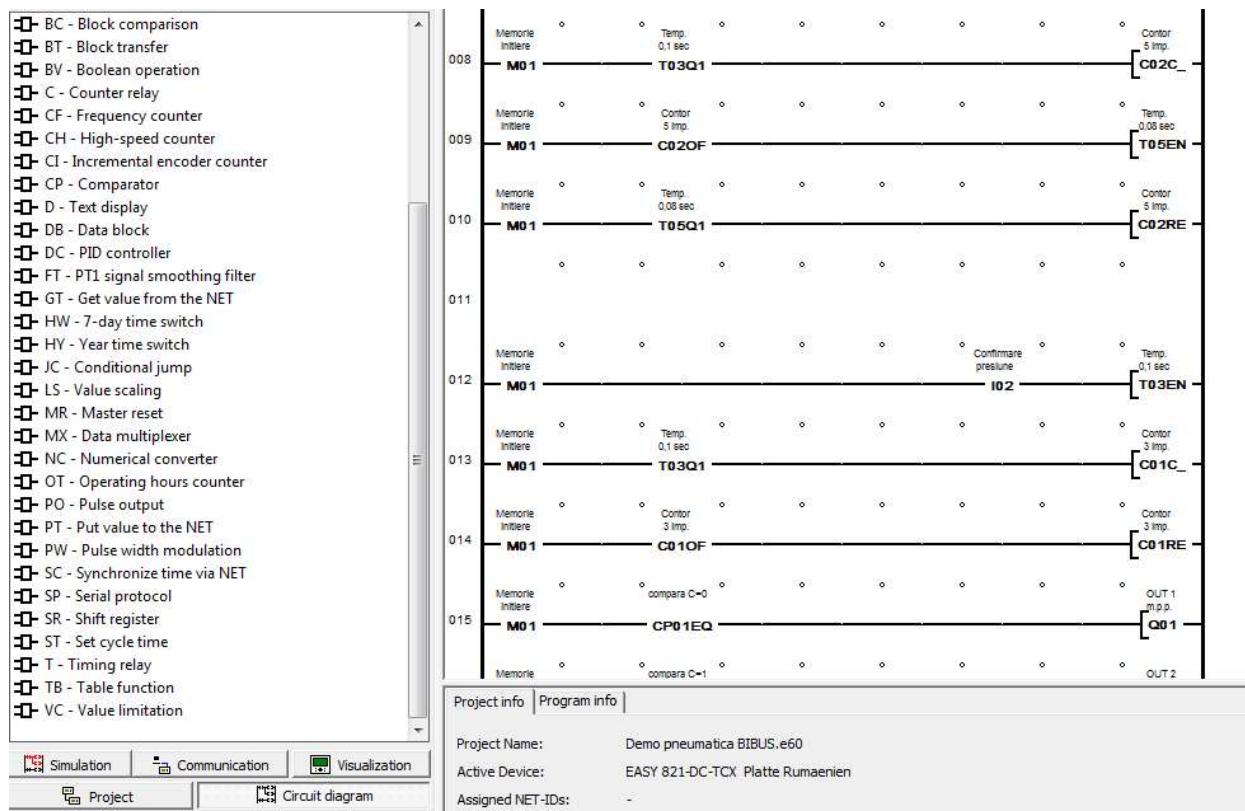
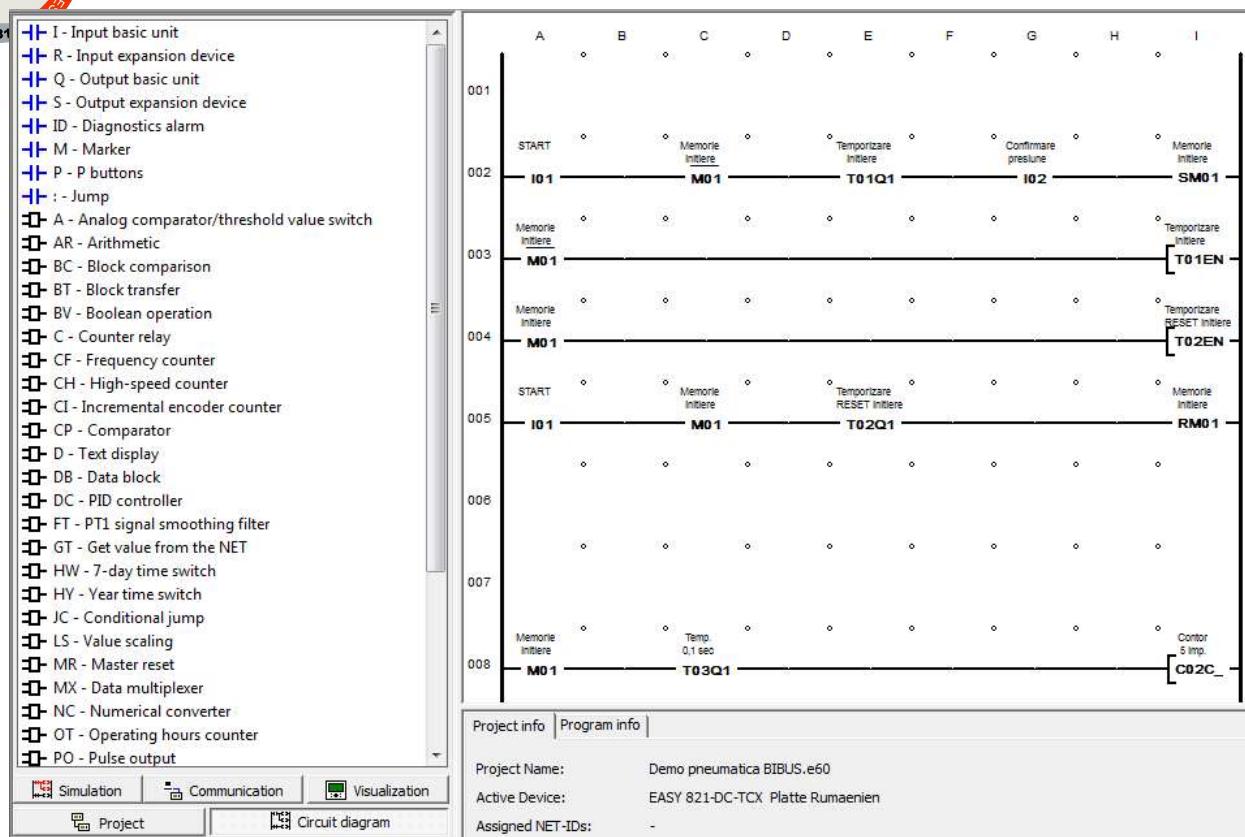


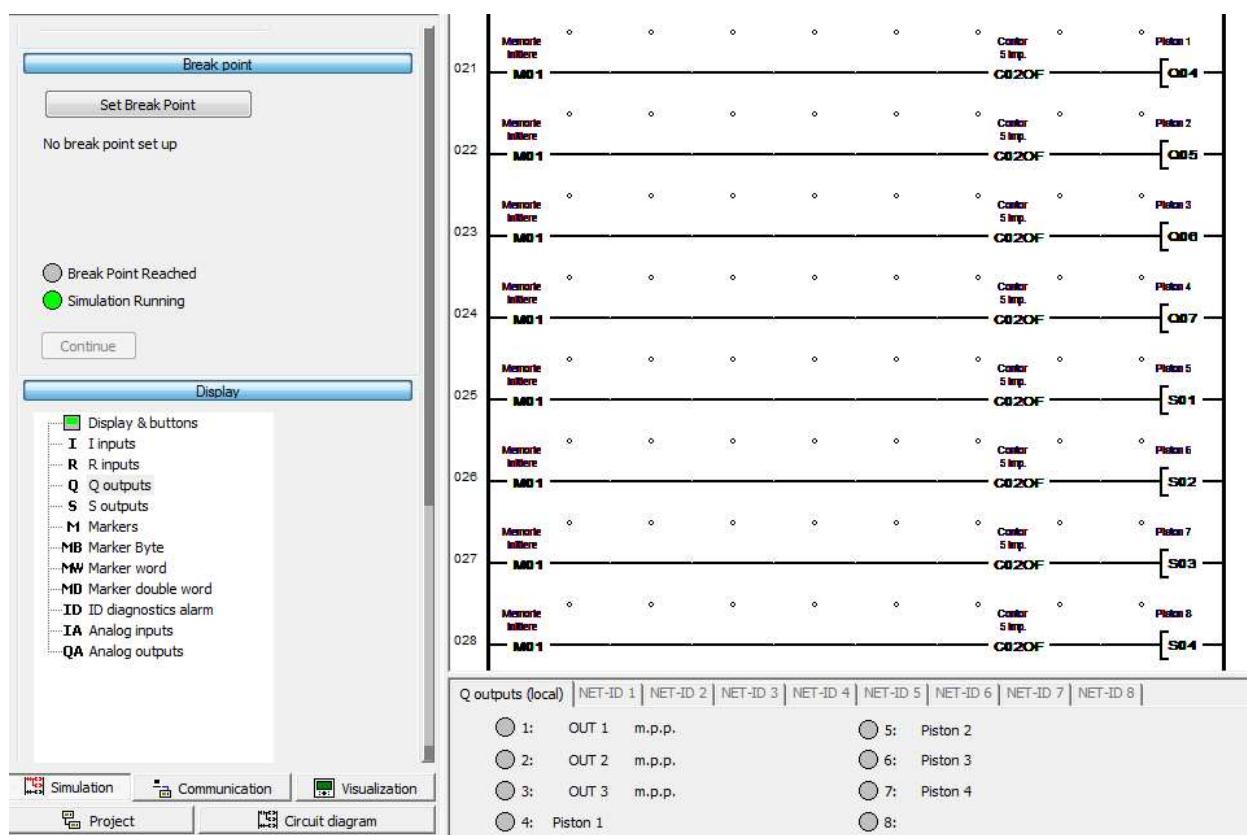
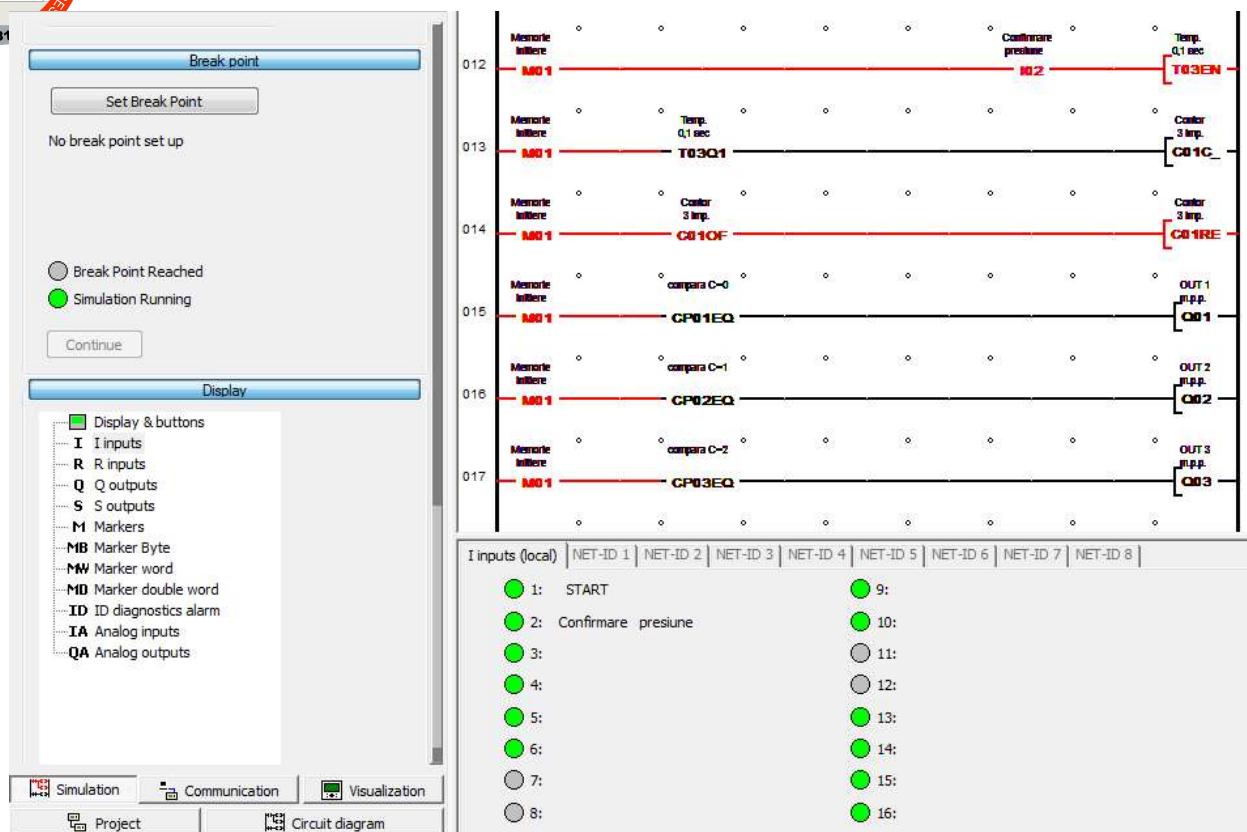
III. Aspects of automatisation

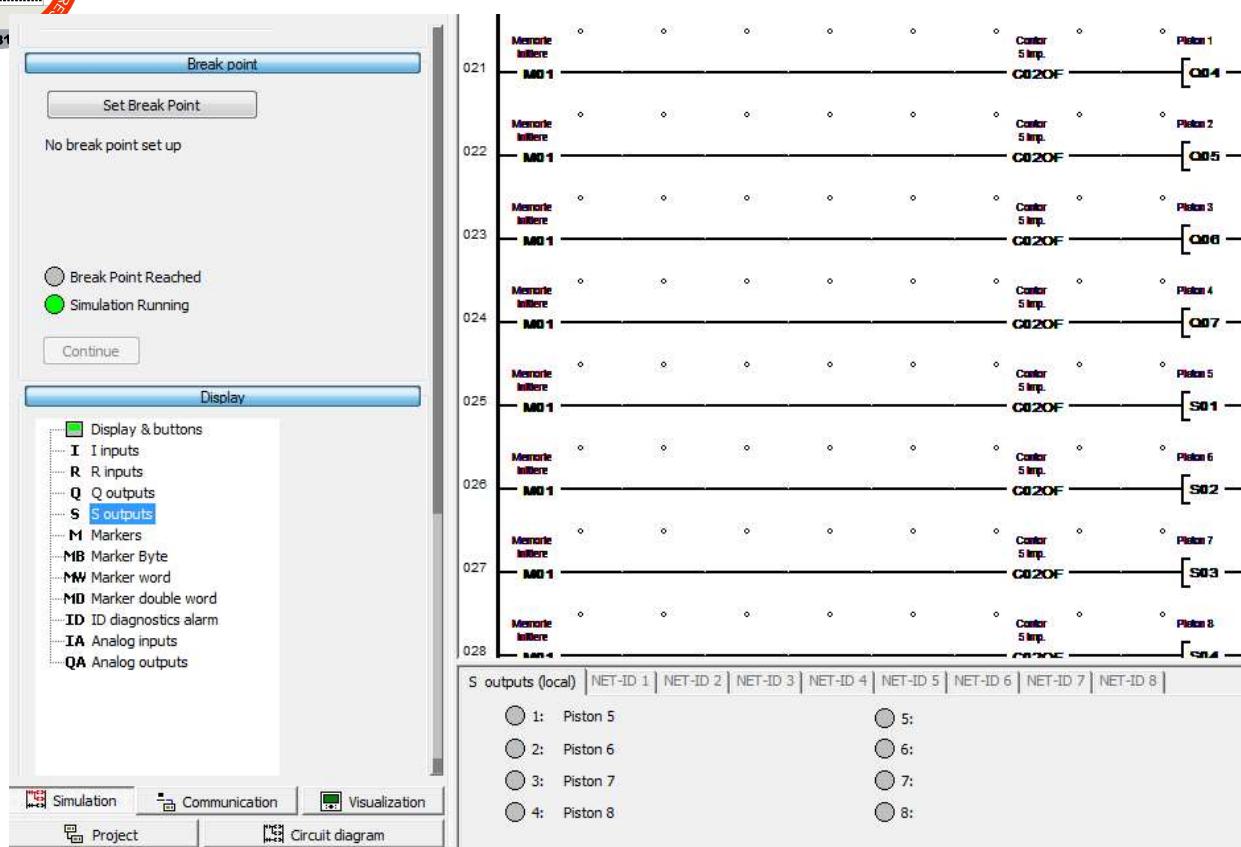
The demonstrative stand was made for gaining access to data in coordinate movement of the stepper motor, transmission and pistons.



The parameters of the movement have been processed with Easy soft 6.







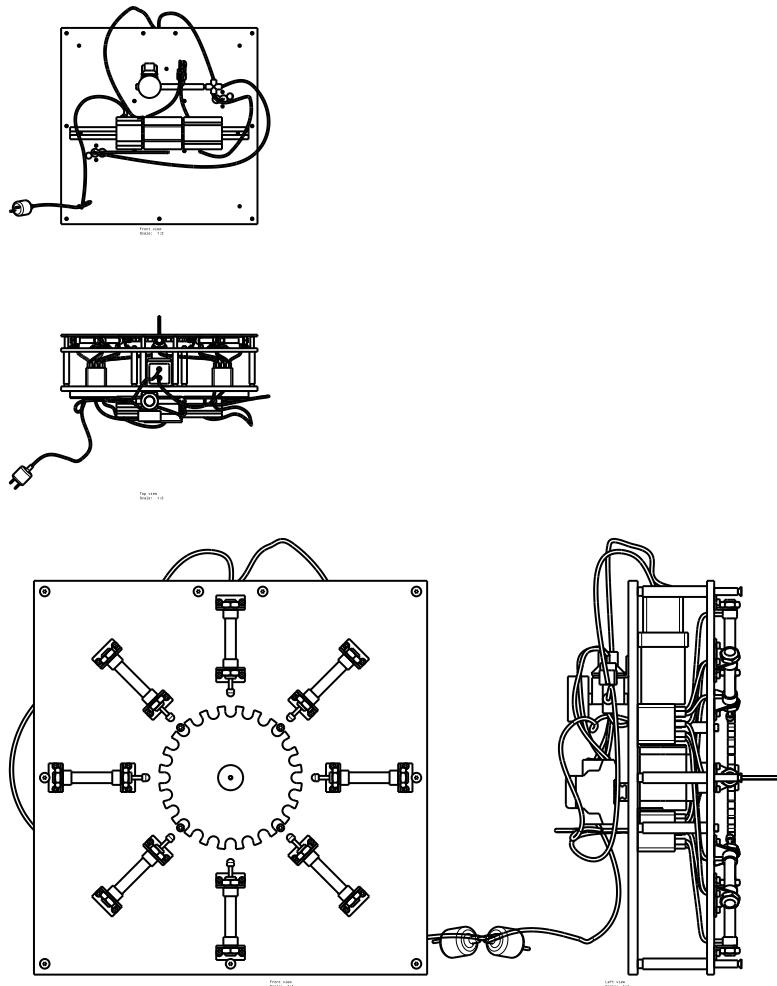
The automatization for the demonstrative stand implies 3 steps:

First is checking pressure and control;

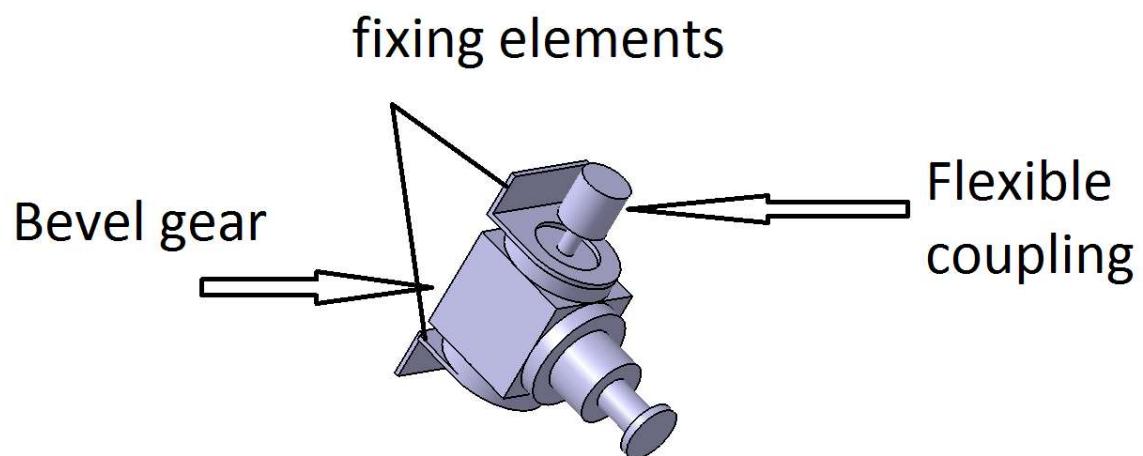
Second, creates movement for pistons, all together must coexist in a union translation to approach the destined slot in center –wheel;

And the third step is specific for the rotation of the wheel, making successive angular rotation just enough for the pistons to perfectly align without damaging the wheel.

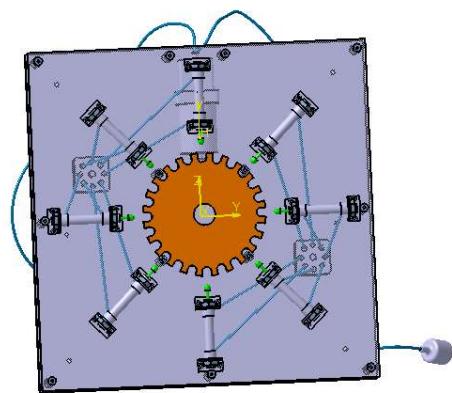
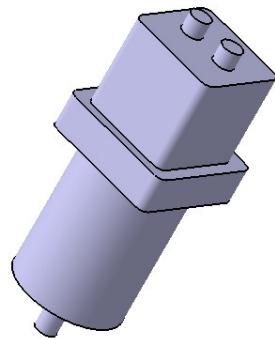
IV. Detailed presentation of the equipment



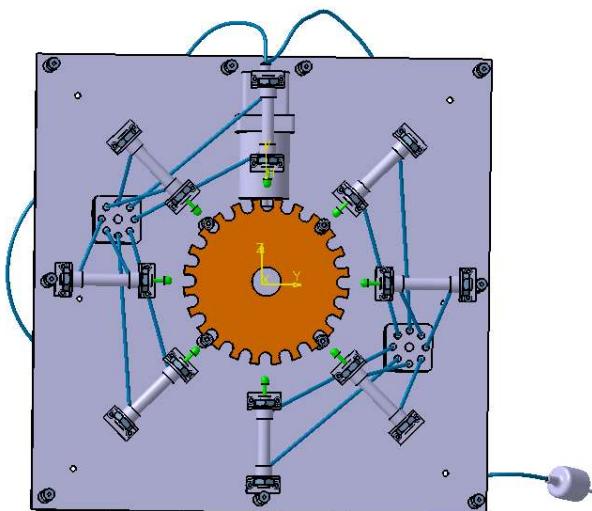
Demonstrative stand without first Plexiglas



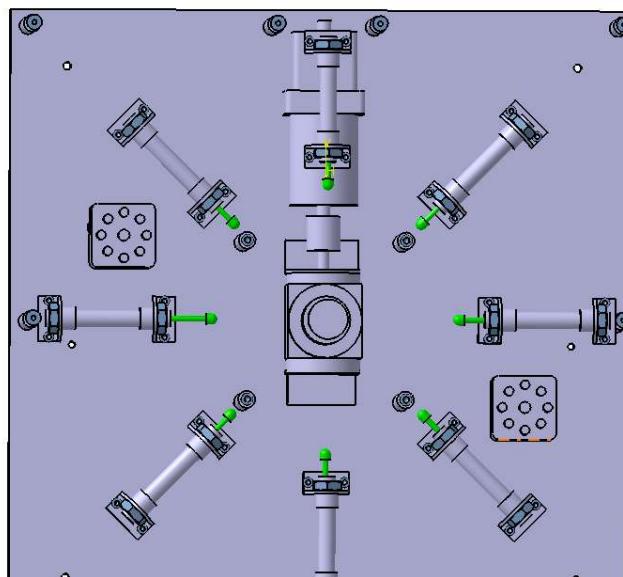
stepper motor with valve

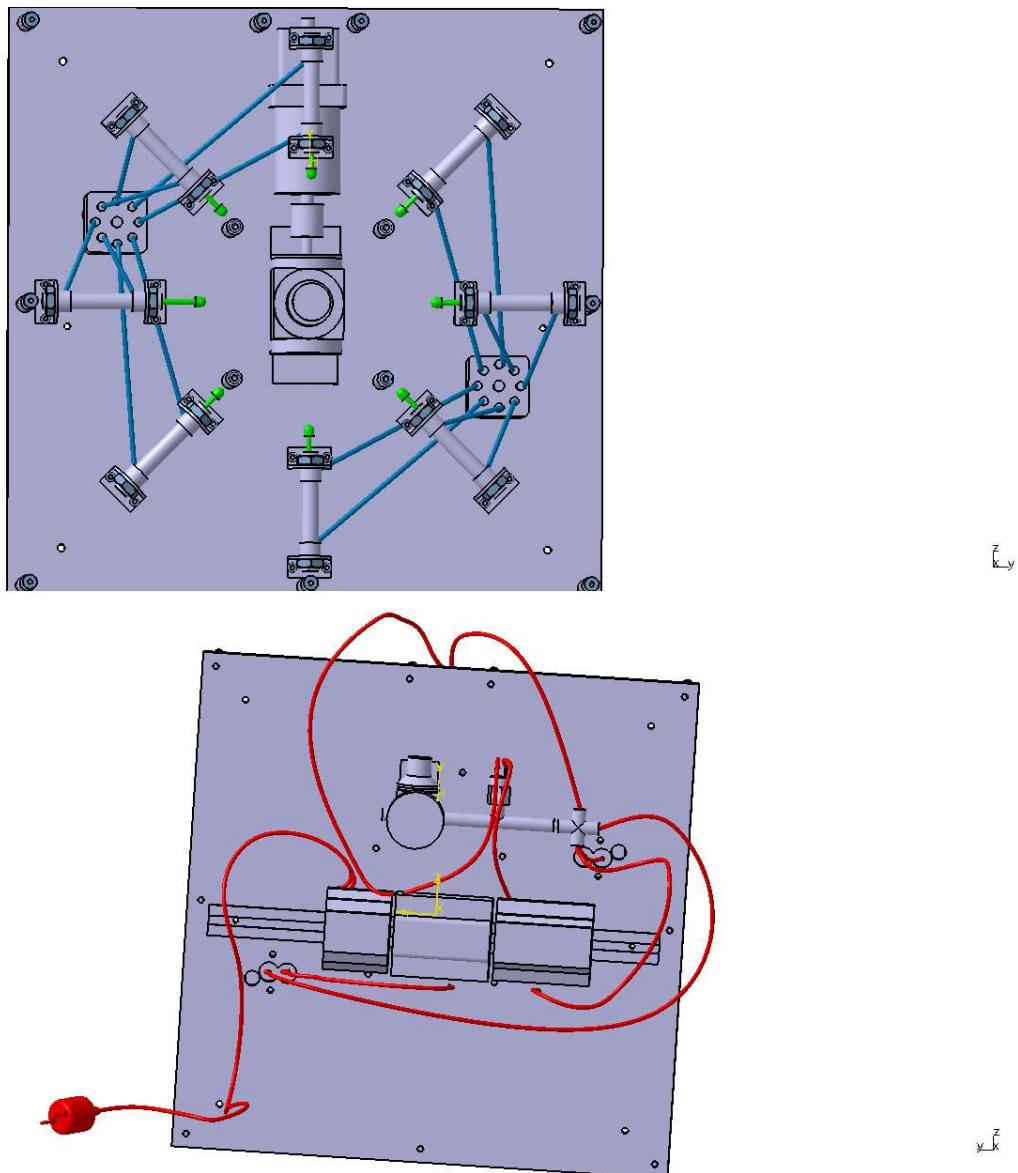


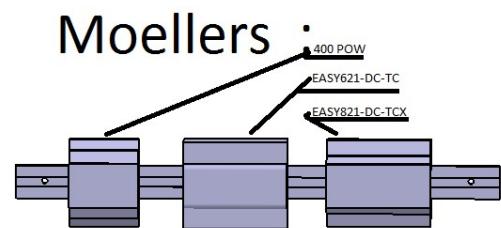
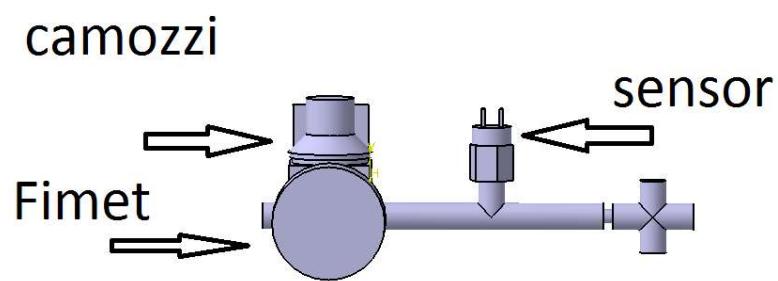
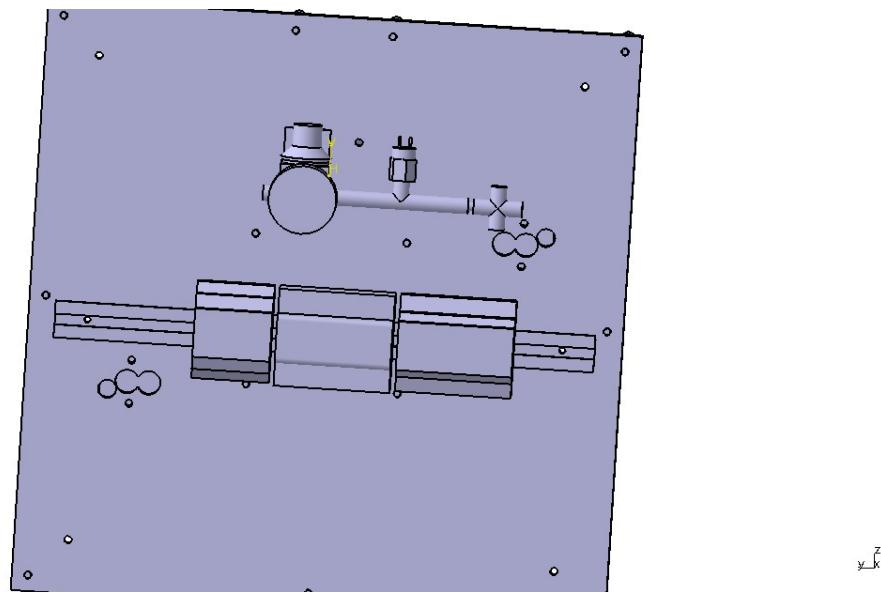
without
wheel and
tubes

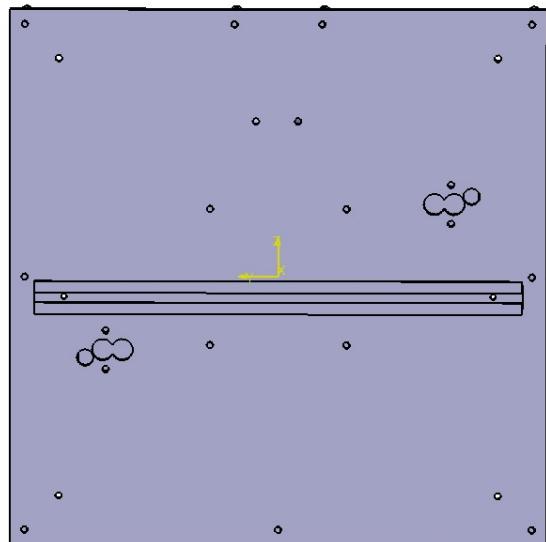


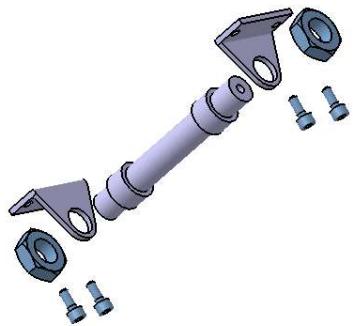
without
plexi 1st
and 2nd





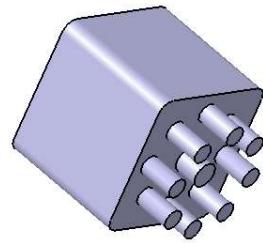






↗
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Matrix valve



↗
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