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## VACUUM SOLUTIONS FOR HIGH PRESSURE DIE CASTING

# **SINCE 1946**

Since 1946, Fondarex has contributed to the successful implementation of thousands of projects in vacuum die casting.
Initially established as a HPDC foundry in Montreux, Switzerland, for over 30 years, the company produced high-quality castings for the automotive and household appliances industries.

In 1952, the first vacuum system was developed in-house for the foundry, with the aim of optimizing the part quality. During the last 45 years, the company has continuously expanded – not only in terms of customers, whose number today exceeds 1000, but also its consistent focus on product development, with an emphasis on reliability. Fondarex has developed and manufactured over 80 dedicated vacuum systems and more than 30 different vacuum valve and chill block models. Fondarex differentiates itself by offering its customers comprehensive advice and technological support for each individual project, based on its extensive know-how and experience. Our goal is for foundries, to be able to produce the bestquality parts as efficiently and cost-effectively as possible.

Thanks to a wider range of newly developed vacuum systems, valves and chill blocks, Fondarex is excited to be participating in the new era of vacuum die casting. Fondarex is also actively taking part in the Giga casting project underway on three continents. This is an incredible story that is in the process of being written, and we are proud to contribute our expertise to shaping the industry. As a provider of total vacuum solutions, from simulation to worldwide on-site support, Fondarex is the partner you are looking for, for all your vacuum-assisted molded parts. These achievements are made possible only through the dedication and expertise of Fondarex's employees and, of course, our customers. Our most heartfelt **THANK YOU** for your trust and loyalty throughout these 75 years.

> D. Baumgartner CEO

### COMPANY

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K. Baumgartner President



# FONDAREX GROUP

As part of its plan to strengthen its presence and customer support, Fondarex SA founded Fondarex Europe GmbH in Dillingen, Germany, and Fondarex (Wuxi) Machinery Co., Ltd in Wuxi, China.

## **SWITZERLAND**

The headquarters of Fondarex, where we develop our vacuum technologies for high pressure die casting and where our production site and warehouse are located.

## **EUROPE**

Created in 2022 in Dillingen, Germany, in the heart of Europe, Fondarex Europe GmbH aims to better serve our European customers in collaboration with our existing representatives. This Fondarex subsidiary will provide technical support, die casting consulting services and faster delivery of spare parts by virtue of its own warehouse.

## ASIA

After 30 years of building a reputable customer network in China, in 2021 Fondarex SA inaugurated Fondarex (Wuxi) Machinery Co., Ltd in Wuxi, China. The goal is to produce a unique range of vacuum systems for the local market that meet the quality standards of our Swiss headquarters and to provide the best technical service and faster delivery of spare parts throughout Asia.

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## **FX PREMIUM**





**ELECTRIC** 

TWO

TWO





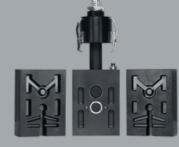












**STEEL VENTS** 

**KINETIC VALVES** 





28-29



HYDRAULIC VALVE

# **ELECTRIC**

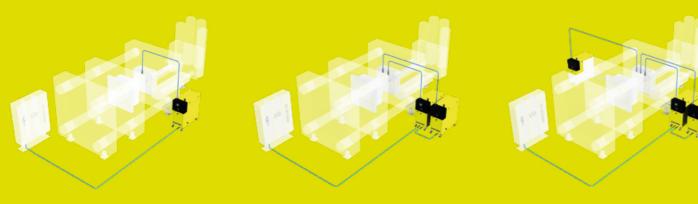
## MOBILE

This new, fully electric vacuum system concept allows connection of up to 3 Electric units together on 1 DCM.

- Compact solution
- Simplified interface
- Affordable unit
- No installation assistance required
- No need for compressed air
- Upgradable up to 3 channels
- Compatible with any DCM
- Available for Zamak applications

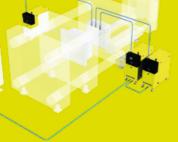
## **POSSIBLE LAYOUTS**

Start with 1 controller unit and add 1 or 2 additional units at any time.



**1 UNIT** 

2 UNITS



**3 UNITS** 



# **ONE/TWO** MOBILE/CELL/CENTRAL

The Fondarex ONE system controls 1 vacuum valve or 1 chill vent and is suitable for die casting machines up to 800 t. The Fondarex TWO system controls 2 valves or 2 chill vents and is recommended for die casting machines up to 1'400 t.

- 1 or 2 vacuum channels
- Easy-to-install system
- Compatible with any vent or mechanical valve
- Easy to use and maintain
- Available for Zamak applications







Filter contamination

control per cycle

Curve display of vacuum measurement



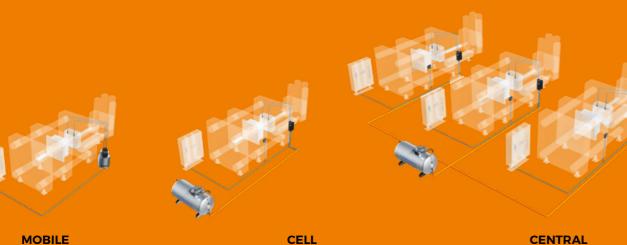
Vacuum measurement in the tank



Valve/vent profile control to ensure performance

Internal storage of 50 production recipes

Error diagnostic display









CENTRAL





# ZAMAK

## MOBILE / EXTENDED / CENTRAL

Based on the FX Premium concept, this unit is specifically adapted for the hot chamber die casting industry.

- Fast vacuum opening
- Vacuum control
- Data transfer
- OPC UA ready
- Compact design



Vacuum measurement

in the tank

display

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Leak test /

leak detection

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Profinet interface

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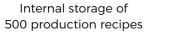
Filter contamination

control per cycle

Curve display of vacuum measurement



Error diagnostic





air volume



Wire interface compatible with the Highvac Premium series



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Vacuum control (3 positions)



Separate electrical and pneumatic cabinets





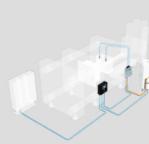
OPC UA ready



Extended version with flexible configuration









EXTENDED



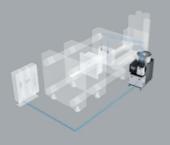


CENTRAL



# FX PREMIUM MOBILE

Since the launch of the Highvac series in 2010, the Highvac Premium system is recognized internationally as the quality standard for vacuum-assisted high pressure die casting. Now being replaced by FX Premium.

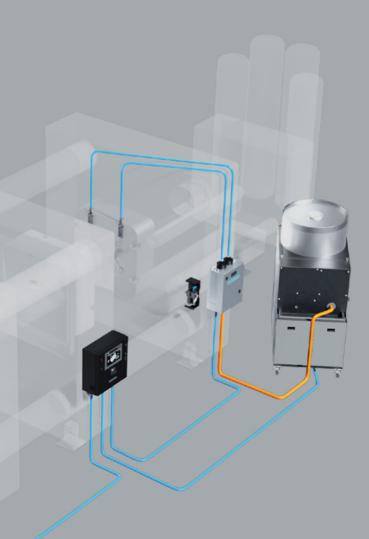


MOBILE

# FX PREMIUM EXTENDED

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Full flexibility of configuration and placement. Simply position the modules to best suit your layout. To ensure the best performance and quality, link the vacuum channels closer to the die.



## **FEATURES**



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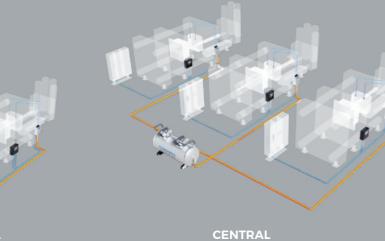
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# **FX PREMIUM** CELL/CENTRAL

The FX Premium electrical and pneumatic cabinets can be purchased for Cell or Central solutions.



CELL















**SPC UA** 



# MODULAR CELL/CENTRAL

A new vacuum concept to meet the demands of the Giga Era and greater casting size.

The Fondarex Modular system allows independent placement of the modules.

The user interface has also been completely redesigned for ease of operation, offering more precise control and comprehensive process analysis.

The system comes with all the standard controls and features for which Fondarex machines are known.



# **MODULAR FEATURES**

<u> TEX</u>



Curve display of vacuum measurement



Leak test /

leak detection

<u>propp</u>® Dnett

Profinet interface

Valve/vent profile control to ensure performance



Evacuated air volume



Wire interface compatible with the Highvac Premium series



Software upgradable at any time



Vacuum measurement in the tank



Filter contamination

control per cycle

F

Internal storage of 500 production recipes

**- (**)

Hydraulic valve

management

Error diagnostic display



Vacuum in shot sleeve

**OPC UA** 

OPC UA ready

### in a dedicated tank before injection.

Individual vacuum channel boxes can be placed wherever needed around the DCM, making it possible to work as closely as possible to the mold.



### ID KEY

The ID key enhances parameters and data security with up to 4 different access levels. Each level has 1 dedicated key.



**INDUSTRY 4.0** 

A new way to manage, communicate and treat data through integrated vacuum process statistics and quality reports. This option includes a web dashboard to follow your production from your laptop.





## **AIR HUMIDITY**

Air humidity is measured by sampling





## **OPTIONS**

precisely controls evacuated airflow. The high-speed control is done independently through each vacuum channel.



### AIRFLOW MEASUREMENT

The module measures evacuated airflow and air volume per vacuum channel.



### INDIVIDUAL VACUUM CHANNELS (up to 8)



### REMOTE CONTROL PANEL

Always keep an eye on the vacuum process data by locating the remote control panel as close as possible to the operator.



GIGA CASTINGS

The Fondarex Modular Cell is the Giga casting vacuum solution for high pressure die casting. This modular concept incorporates robust, modern technology to guarantee continued satisfactory use.









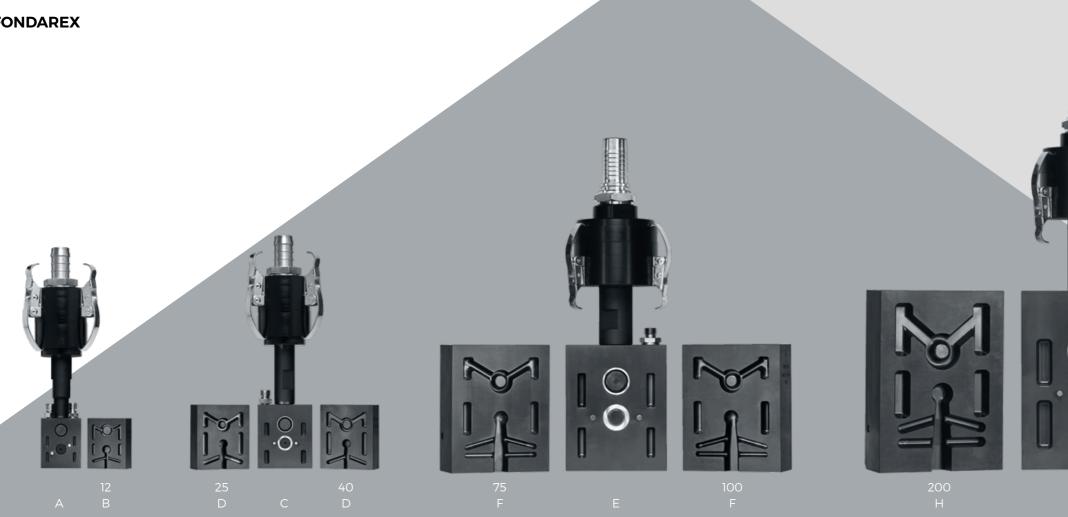
# **STEEL VENTS**

The aerodynamic profile of our SCS steel vent ensures both efficient air evacuation and fast alloy solidification. The SCS steel vent delivers reliable performance for over 400,000 shots.

MODEL	SCC	z 12-1	SCS	30-1	SCS	60-1	SCS	100-1	SCS	140-1
SECTION [mm <sup>2</sup> ]	1	2	3	0	6	0	10	00	14	¥0
DCM TONNAGE [t]	< 200 a	approx.	< 400 a	approx.	200 -	1200	800 -	2800	1600 -	- 4500
SHOT WEICHT AI [kg]		/	0.1 -	- 1.5	0.7	- 10	5 -	22	10 -	- 40
SHOT WEICHT Mg [kg]	0.05	- 0.8	0.07	7 – 1	0.5	- 6	3 -	12	6 -	26
SHOT WEIGHT Zn [kg]	0.1	- 3	0.2	- 4	1 -	20		/	,	/
DIMENSIONS	А	В	С	D	Е	F	G	Н	l I	J
WIDTH [mm]	63	63	63	63	100	100	140	140	150	150
DEPTH [mm]	63.4	63.5	50	50	50	50	60	60	80	80
HEIGHT [mm]	100	99	150	149	250	249	300	299	360	359



140-1



# **KINETIC VALVES**

### LOW AND EASY MAINTENANCE





KINETIC VALVES

300 / 200

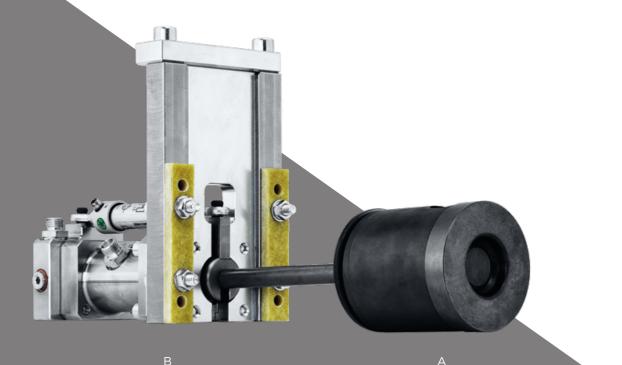


REDESIGNED FILTER



MODEL		C VALVE 2	KINETIC VALVE 40/25			KINETIC VALVE 100 / 75		KINETIC VALVE 300 / 200	
PROFILE [mm <sup>2</sup> ]	12			25 40		75 100		200 300	
DCM TONNAGE [t]	20 -	200	80 - 800		200 -	200 - 2000		1200 - 6000	
SHOT WEIGHT [kg]	ZN 0.1 – 2		ZN 0.2 - 8 AL 0.2 - 5		ZN 0.8 - 14 AL 0.6 - 15		AL 7 - 50		
DIMENSIONS	А	В	С	D	Е	F	G	Н	
WIDTH [mm]	40	40	55	55	100	100	125	125	
DEPTH [mm]	44	20	50	25	75	50	95.5	57.5	
HEIGHT [mm]	50	50	65	65	125	125	175	175	





# HYDRAULIC VALVE

The redesign of the Hydraulic vacuum valve features high evacuation capacity, high reliability, easy integration in the mold and smart control of the evacuation piston stroke.

- Vacuum valve controlled by a hydraulic cylinder
- 300 mm<sup>2</sup> vacuum valve evacuation capacity
- Reactive manifold connected to the hydraulic circuit of the DCM
- 50 ms Hydraulic valve closing time
- Stroke control of the evacuation piston through the Fondarex Modular unit

### MODEL

SECTION [mm <sup>2</sup> ]
DCM TONNAGE [t]
SHOT WEIGHT [kg]
DIMENSION VACUUM VALVE BODY [mm]
FIXATION VACUUM VALVE BODY
LENGTH VACUUM PISTON [mm]
DIAMETER VACUUM PISTON ROD [mm]
LENGTH VACUUM PIPE [mm]

MODEL	HYDRAULIC CYLINDER WITH COUPLING (B)
LENGTH [mm]	187
WIDTH [mm]	110
HEIGHT [mm]	200

### MOLD VACUUM VALVE (A)

300
6000
AL 7 – 50
80 <b>ø</b> x 95
4 x M8 90 x 50
Up to 900
20 Ø
Up to 1000

### MANIFOLD

### **ELECTRICAL CABINET**

266	400
139	210
268	300



# **TECHNICAL SUPPORT**

Our experienced engineers provide support at your production sites.

> We take care of: mold conception, installation/start-up, on-site training and maintenance.

Your continued satisfaction is our primary goal.

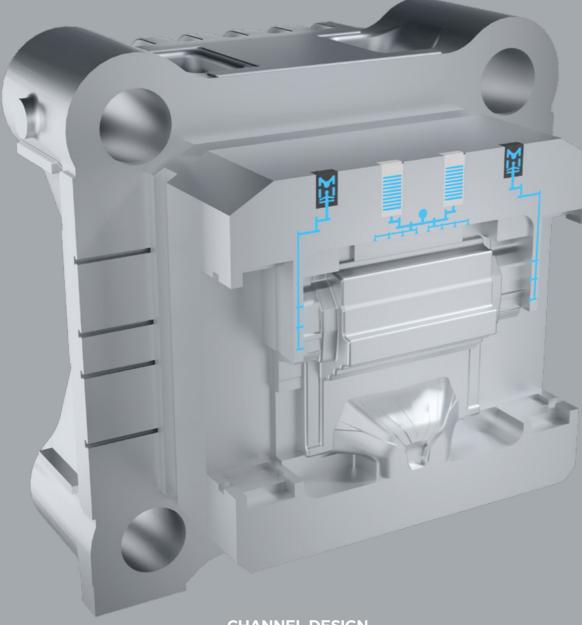
## **REMOTE ASSISTANCE**

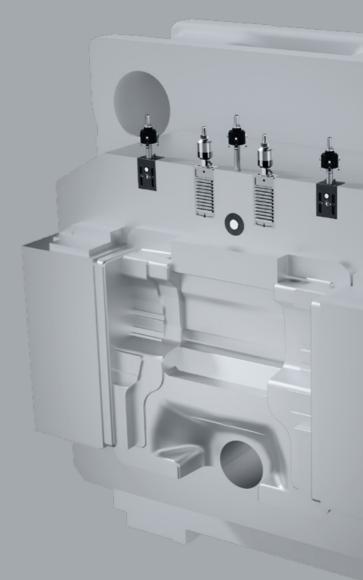
Our experts can provide real-time instructions and guidance for faster troubleshooting.

### FONDAREX / 31



# VACUUM APPLICATIONS





### SIMULATION

### CHANNEL DESIGN

## **TECHNICAL DATA**

MODEL	ELECTRIC	ONE / TWO	ZAMAK HOT CHAMBER	FX PREMIUM
TYPE OF VACUUM UNIT	Mobile 150 Controller / Peripheral	ONE 300 TWO 500	Mobile 300	Mobile 700 Mobile 950
TANK [l]	150	300 500	300	700 950
PUMP [m³/h]	25	40	40	63 100 (Also with model 700)
CHANNELS	Up to 3	1 2	2	2
TYPE OF DIE CAST PROJECT	Simple parts	Standard parts	All zinc parts	Complex and security parts
DCM [t]	Up to 600	Up to 800 Up to 1400	Up to 800	Up to 2200 Up to 3000
DIMENSIONS L X D X H [m]	1.05 x 0.4 x 1.15	0.7 x 0.7 x 1.8 0.9 x 1.0 x 1.8	1.2 x 0.59 x 1.43	0.9 x 1.3 x 1.5 0.9 x 1.3 x 1.9
INTERFACE	Potential free contacts	Potential free contacts	Potential free contacts Optional Profinet	Potential free contacts Optional Profinet
NUMBER OF VACUUM SENSORS	1	2 3	3	3
DATA MANAGEMENT	Internal log data	Internal log data	Data communication	Data communication
VACUUM MEASUREMENT IN THE TANK	ОК	ОК	ОК	ОК
ERROR DIAGNOSTIC DISPLAY	ОК	ОК	ОК	ОК
PRODUCTION DATA (INTERNAL STORAGE)	ОК	ОК	ОК	OK
PRODUCTION DATA (EXPORT)	ОК	OK	ОК	ОК
STANDBY MODE FOR ENERGY SAVING	ОК	OK	ОК	ОК
EVACUATED AIR VOLUME	ОК	/	ОК	ОК
COMPATIBLE WITH CHILL VENTS	ОК	OK	ОК	ОК
COMPATIBLE WITH MECHANICAL VALVES		ОК	ОК	OK
VACUUM MEASUREMENT BY CHANNEL		ОК	ОК	ОК
VACUUM PROCESS OVERVIEW		ОК	ОК	ОК
REMOTE CONTROL PANEL		Option	OK (Option connection cables)	OK (Option connection cables)
		ОК	ОК	ОК
PROFILE CONTROL		ОК	/	ОК
VACUUM CURVE DISPLAY		OK	ОК	ОК
ANALOG CURVE DISPLAY ON DCM			Option	Option
LEAK DETECTION			ОК	ОК
REAL-TIME VACUUM CONTROL			ОК	ОК
EXTENDED LAYOUT			OK (Option connection cables and hoses)	OK (Option connection cables and hoses)
REMOTE ASSISTANCE (EWON)			Option	Option
ADVANCED COMMUNICATION PROCESSOR			Option, CP or OPC UA	Option, CP or OPC UA

### FONDAREX / 35

MODEL	FACTORY VACUUM	ONE / TWO	ZAMAK	FX PREMIUM	MODULAR
TYPE OF VACUUM UNIT	Cell (Central + Factory Vacuum)	ONE Central TWO Central	Central	Central	Central
TANK [l]	1000 2000 3000 4000 and more	/	/	/	/
PUMP [m³/h]	1x/2x 100 1x/2x 160 1x/2x 200 1x/2x 250 1x/2x 300 and more	/	/	/	/
CHANNELS	All	1 2	2	2	Standard up to 6 Extended up to 18
TYPE OF DIE CAST PROJECT	All	Standard parts	Complex and security parts	Complex and security parts	Complex, security, structural parts and Giga casting
DCM [t]	All	All	All	All	All
DIMENSIONS L X D X H [m]		0.4 x 0.3 x 0.7	Main cabinet 0.5 x 0.5 x 0.21 Channel cabinet 0.4 x 0.5 x 0.21	Main cabinet 0.5 x 0.5 x 0.21 Channel cabinet 0.4 x 0.5 x 0.21	User cabinet 0.313 x 0.112 x 0.38 Standard main cabinet 0.8 x 0.3 x 1.0 Extended main cabinet 0.8 x 0.6 x 2.0 Channel cabinet 0.3055 x 0.3 x 1.05
INTERFACE		Potential free contacts	Potential free contacts Option Profinet	Potential free contacts Option Profinet	Option potential free contacts Option Profinet / Profibus / OPC UA
DATA MANAGEMENT		Internal log data	Data communication	Data communication	Data analysis and communication
VACUUM MEASUREMENT IN THE PIPELINE		ОК	OK	ОК	ОК
ERROR DIAGNOSTICS		ОК	ОК	OK	ОК
PRODUCTION DATA (INTERNAL STORAGE)		ОК	ОК	ОК	ОК
PRODUCTION DATA (EXPORT)		ОК	OK	ОК	ОК
STANDBY MODE FOR ENERGY SAVING		ОК	OK	ОК	ОК
VACUUM MEASUREMENT BY CHANNEL		ОК	OK	ОК	ОК
VACUUM PROCESS OVERVIEW		OK	ОК	ОК	ОК
REMOTE CONTROL PANEL		Optional	OK (Option connection cables)	OK (Option connection cables)	ОК
VACUUM CURVE DISPLAY		OK	ОК	OK	ОК
CONTAMINATION CONTROL		OK	OK	OK	ОК
PROFILE CONTROL		OK	/	OK	ОК
COMPATIBLE WITH CHILL VENTS		OK	OK	OK	ОК
COMPATIBLE WITH MECHANICAL VALVES		OK	OK	OK ,	ОК
COMPATIBLE WITH HYDRAULIC VALVES			/	/	ОК
			OK	OK	ОК
			OK	OK	ОК
REAL-TIME VACUUM CONTROL			OK	OK	ОК
ANALOG CURVE DISPLAY ON DCM			Option	Option	Option
REMOTE ASSISTANCE (EWON) ADVANCED COMMUNICATION			Option Option, CP or OPC UA	Option Option, CP or OPC UA	Option Option, CP or OPC UA
PROCESSOR INDUSTRY 4.0 (WITH WEB DASHBOARD)					Option
AIRFLOW / AIR VOLUME MEASUREMENT					Option
ID KEY					Option
					Option
HUMIDITY CONTROL					Option
SIGNAL MODE WITHOUT TIMER					ОК
STROKE MODE (WITH PISTON POSITION)					ОК
INDEPENDENT CHANNELS					ОК
PRESSURIZING					ОК
					OK
VACUUM ON EJECTOR CASE					ОК
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