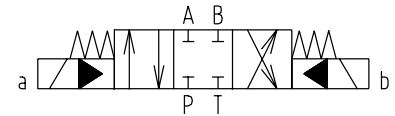


- Solenoid pilot operated directional valves (RPEH)
- Hydraulic pilot operated directional valves (RPH)
- Small energy input
- Wet pin core tubes
- Manual overrides optional (only for RPEH)
- Installation dimensions to DIN 24 340, ISO 4401, NFPA T 3.5.1 M R1 and ANSI B 93.7 D 07



Functional Description

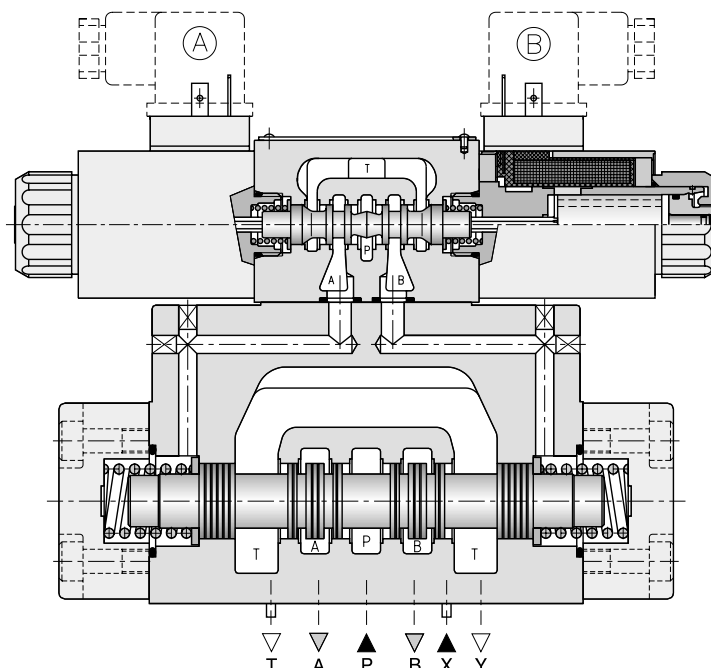
The RPEH solenoid operated - hydropiloted valves are consisting of an RPE3-06 or RPEW4-06 type solenoid operated directional control valves (see data sheets HU 4010, 4035) that operates a 4-way hydropiloted control valve with a connection surface in accordance with the CETOP standards. They are available in various configurations and spool types.

The pilot and the drain connections can be made internal or external by inserting or removing the proper threaded plugs located in the main directional control valve.

A wide range of configurations and different solenoid operated - hydropiloted directional control valve spool positions are available:

- 4-way, 3-position directional control valve, with two solenoids; positioning of the spool in center position is obtained with centering springs.
- 4-way, 2-position directional valve, with one solenoid and one return spring or two solenoids and detent of the spool position.

The basic surface treatment of the valve housing is phosphate coated and the solenoids are zinc coated.



Order Code

RP **4-16** / / **-13-** /

Directional control valves pilot operated

Type of control
 electrohydraulically operated **EH**
 hydraulically operated **H**

Design series

Valve size **D 07 (16)**

Number of operating positions
 two positions **2**
 three positions **3**

Spool symbols
 see the table spool symbols

Controls
 if not required omit
 main spool shifting speed control **D**
 shifting speed control, with orifice \varnothing 0.032 in. (0.8 mm) in port P of solenoid pilot valve **PF**

Piloting
 if not required omit
 external piloting (see note herebelow) **E**

Seals
 omit NBR
V FPM (Viton)

Manual override
 omit standard
N1 *covered with retaining nut
N2 *covered with rubber boot

Pilot valve
 omit Standard RPE3-06 with DIN connector
K **RPEW4-06 with wirebox for DC and direct AC
R **RPEW4-06 with wirebox AC rectified (rectifier in wirebox)
 See data sheet HU 4035.

Type of solenoid coil
E1 Standard
E2 with quenching diode
 For connections other than "DIN connector" consult factory.

Rated supply voltage of solenoids
 (at the coil terminals)

01200	12 V DC / 2.72 A
02400	24 V DC / 1.29 A
12060	120 V AC / 60 Hz

Other voltages per request.

Series number

Check valve incorporated in P-line
 omit if not required
C3 with check valve (see page 8)

Drain
 omit external drain which is recommended when the valve is used with back pressure on the outlet
I internal drain

Note: Piloting must always be external for valves with the H11 type pilot valve (available on request). Also valve must have external piloting for spools with P and T connected in the center position. Internal piloting is possible only with a C3 version valve (see page 8), or by installing a check valve with a setting of min. 72.5 PSI (5 bar) on the outlet line. In this case the valve must have external drainage.

Piloting must always be external for valves with the **RPH** type hydraulic control valve (available on request).

Note: Electrical connector have to be ordered separately see page 7.

* Non valid for direct AC.

** **Pilot valve with Wirebox** - For technical data, dimensions and spare parts see data sheet HU 4035.

Technical Data

Valve size	US (mm)	D 07 (16)
Maximum flow rate from port P to A, B, T	GPM (L/min)	80 (300)
Max. operating pressure ports P, A, B port T port T (external drain version)	PSI (bar)	4600 (320) 3000 (210) 3600 (250)
Pressure drop	PSI (bar)	see pressure drop $\Delta p-Q$
Hydraulic fluid		Petroleum oils (HM, HL, HLP) Phosphate ester fluids (HFD-R)
Fluid temperature range for NBR seals	°F (°C)	-22 ... +176 (-30 ... +80)
Fluid temperature range for FPM seals	°F (°C)	-4 ... +176 (-20 ... +80)
Ambient temperature max.	°F (°C)	up to +122 (+50)
Viscosity range	SUS (mm ² /s)	98 ... 1840 (20 ... 400)
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406 (1999)
Weight - RPEH4-162 - RPEH4-163	lbs (kg)	19 (8.5) 20 (9.1)

Spool Symbols

Symbols are referred to the solenoid valve RPEH. For the hydraulic control version RPH please verify the connection scheme (see page 7).

Three positions with spring centering		Three positions with spring centering	
Z11		H11	
Y11		C11	
Two positions with return spring		Two positions with return spring	
R51		X51	
R52		X52	
Two positions with mechanical detent on pilot valve			
J17			
J27			

Besides the diagrams shown, which are the most frequently used, other special versions are available: consult our technical department for their identification, feasibility and operating limits.

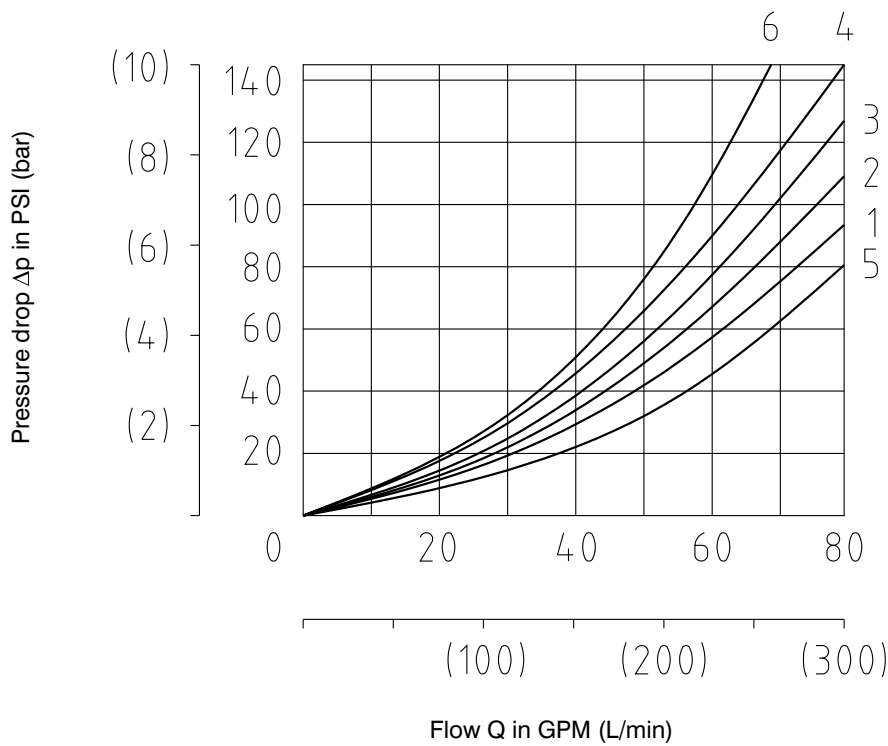
Performance Characteristic

Pressures in PSI (bar)	MIN.	MAX.
Pilot pressure	72.5 (5)	3043 (210)
Pressure on line T with internal drainage	-	2029 (140)
Pressure on line T with external drainage	-	3623 (250)

Maximum flow rates in GPM (L/min)	PRESSURES	
	3045 PSI (210 bar)	4640 PSI (320 bar)
Spool type C11	66 (250)	53 (200)
All other spools	80 (300)	66 (250)

Pressure Drop Δp -Q

Measured at $v = 166 \text{ SUS } (35 \text{ mm}^2/\text{s})$ and $t = 122 \text{ }^\circ\text{F } (50 \text{ }^\circ\text{C})$



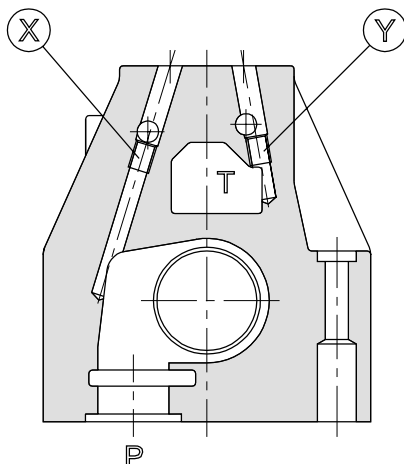
Spool type	Spool position	Connections				
		P - A	P - B	A - T	B - T	P - T
		Curves on graph				
Z11	Energized	1	1	2	3	
H11	De-energized Energized	5	5	1	2	6*
Y11	De-energized Energized	1	1	4* 1	4° 2	
C11	De-energized Energized	6	6	3	4	6
R51, R52, X51, X52	De-energized Energized	1	1	2	3	
J17, J27	Energized	1	1	2	3	

* A-B blocked • B blocked ° A blocked

Pilot and Drain

The RPEH4 valves are available with pilot and drain, both internal and external. The version with external drain allows for a higher back pressure on the outlet.

Type of valve		Plug assembly	
		X	Y
RPEH4-16**/*	Internal pilot and external drain	NO	YES
RPEH4-16**/*I	Internal pilot and internal drain	NO	NO
RPEH4-16**/*E	External pilot and external drain	YES	YES
RPEH4-16**/*EI	External pilot and internal drain	YES	NO



X: plug M6 x 8 for external pilot
Y: plug M6 x 8 for external drain

Electrical Features

The operating solenoids are DC solenoids. For AC supply the solenoids are provided with rectifier which are integrated in the DIN connector socket as part of the solenoid. The connectors can be turned by 90°. By loosening the nut, the solenoids can be turned or replaced without interfering with any seals of the valve.

In the case of solenoid malfunction or power failure, the spool of the valve can be shifted by manual override, provided the pressure in T-port does not exceed 363 PSI (25 bar).

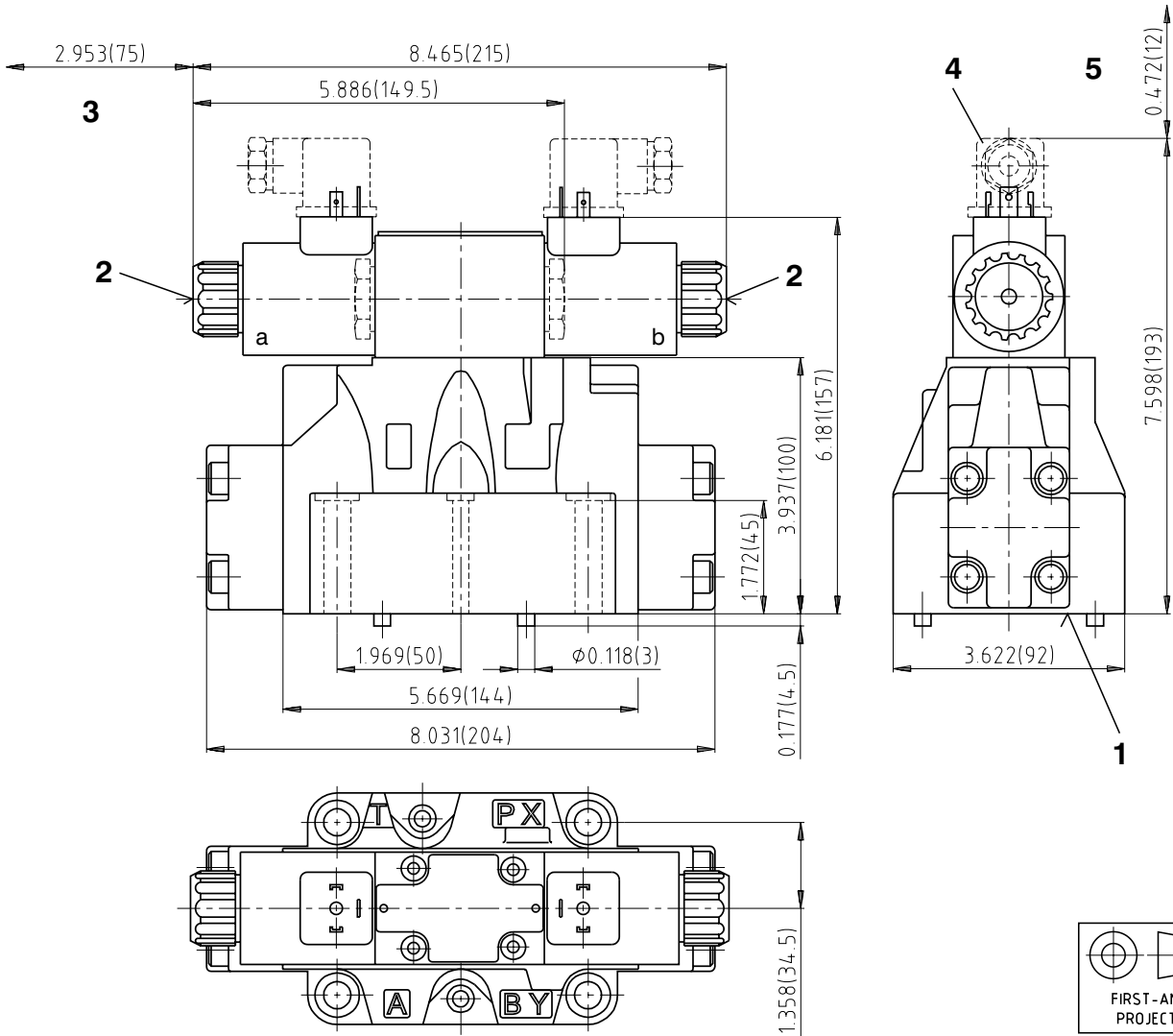
		DC solenoid	AC solenoid
Max. allowable voltage variation	%	-10 ... +6	±10
Max. switching frequency	1/h	10 000	
Switching times ±10 %, energizing (two position)	ms	70	60
Switching times ±10 %, de-energizing (two position)	ms	80	80
Switching times ±10 %, energizing (three position)	ms	50	80
Switching times ±10 %, de-energizing (three position)	ms	60	60
Duty cycle	%	100	
Service life	cycles	10 ⁷	
Enclosure type to DIN 40 050		IP 65	

The values indicated refer to a solenoid valve operating with piloting pressure 1450 PSI (100 bar), with mineral oil at a temperature of 122 °F (50 °C), a viscosity of 166 SUS (35 mm²/s) and with PA and BT connections. The switch on times are obtained from the time the spool switches over. The switch off times are measured at the time pressure variation occurs in the line.

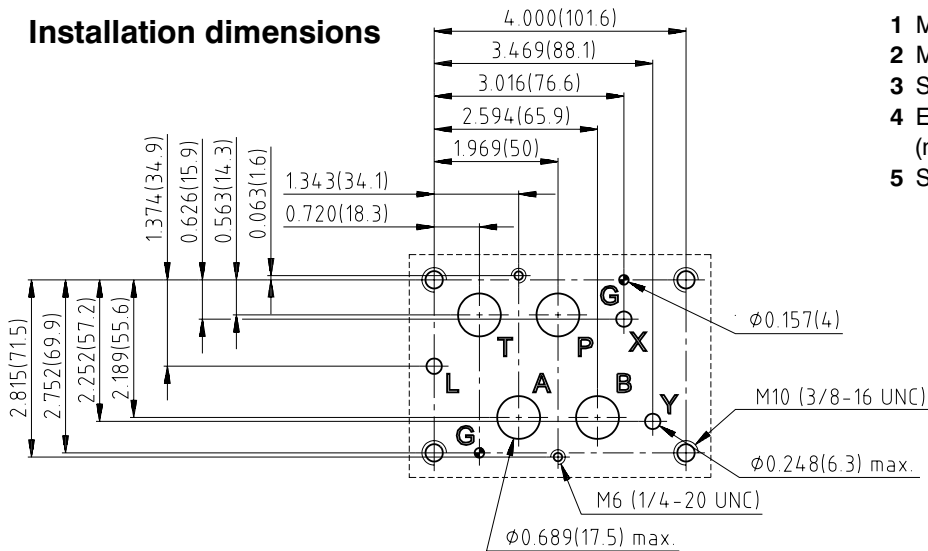
Valve Dimensions

Dimensions in inches and millimeters (in brackets)

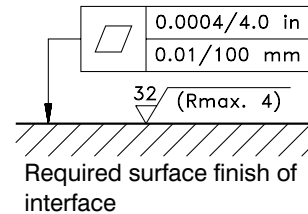
RPEH4-162, RPEH4-163



Installation dimensions



- 1 Mounting surface with seal rings
- 2 Manual override
- 3 Space required to remove coil
- 4 Electrical connector (must be ordered separately)
- 5 Space required to remove connector



Single valve fastening: 4 bolts M10 x 60 (3/8-16 UNC x 2 1/4")
2 bolts M6 x 60 (1/4-20 UNC x 2 1/4")

Bolt torque: M10 x 60: 29.5 ft-lbs (40 Nm) - bolts A 8.8
M6 x 60: 5.9 ft-lbs (8 Nm) - bolts A 8.8

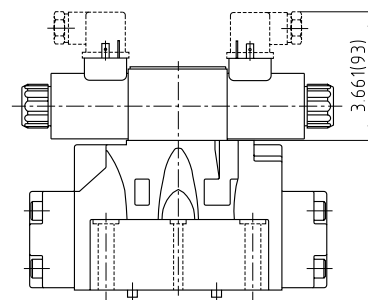
Threads of mounting holes: M6 x 18 (1/4-20 UNC); M10 x 18 (3/8-16 UNC)

Seal rings: 4 O-rings type 22.22 x 2.62
2 O-rings type 10.82 x 1.78

Type of Command

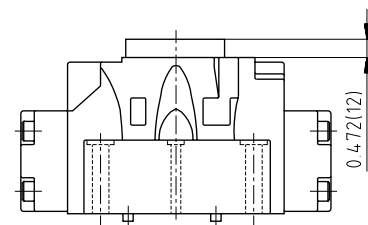
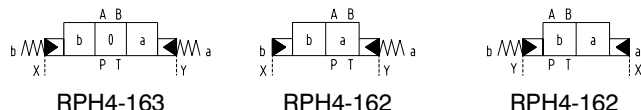
Solenoid control: RPEH

The valve is supplied with a pilot solenoid valve type RPE3-06.



Hydraulic control: RPH

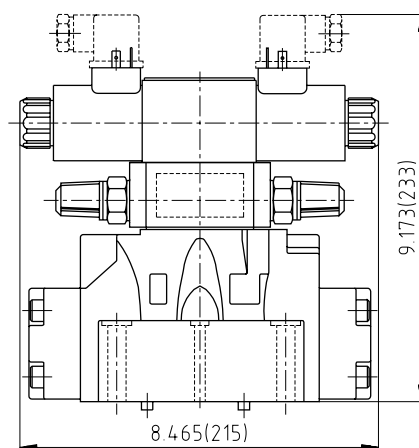
The valve is supplied with a cross-connection cover-plate. X and Y connections are used for the hydraulic control of the valve.



Controls

Control of the main spool shifting speed: D

By placing a 2VS3-06 type double flow control valve between the pilot solenoid valve and the hydro-piloted valve, the piloted flow rate can be controlled and therefore the shifting speed can be varied. Add the letter **D** to the identification code to request this device.



Manual Override

Whenever the solenoid valve installation may involve exposure to atmospheric agents or be used in tropical climates, the manual override, boot protection is recommended. Add the suffix **N1** or **N2** to request this device.

Electrical Connector

The solenoid valves are never supplied with connector. Connectors must be ordered separately.

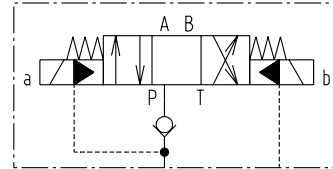
Electrical connector, DIN 43 650

Type	Model	Max. input voltage	Connector A	Connector B
			gray	black
Order number				
K1	DIN connector - Pg11	230 V AC/DC	936-9902	936-9901
K5	DIN connector - Pg9	230 V AC/DC	936-9906	936-9905
K11	DIN connector - 1/2 NPT	230 V AC/DC	936-9925	936-9926
K2	DIN connector with LED - Pg11	230 V AC/DC	936-9918	936-9919
K2	DIN connector with LED - Pg11	12 ...24V DC	936-9908	936-9907
K2	DIN connector with LED - Pg11	120 V AC	936-9916	936-9917
K12	DIN connector with LED - 1/2 NPT	12 ...24V DC	936-9927	936-9933

Special configuration C3

Check valve incorporated on line P: C3

Valve RPEH is available upon request with check valve incorporated on line P. This is particularly useful to obtain the necessary piloting pressure when the control valve, in the rest position, has line P connected to the T outlet. The cracking pressure is 73 PSI (5 bar). Add **C3** to the identification code for this request.



Installation

Configurations with centering and recall springs can be mounted in any position; type J17, J27 valves - without springs and with mechanical retention must be mounted with the longitudinal axis horizontal. Valve fastening takes place by means of screws or tie rods, placing the valve on a flat surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing. If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.

Spare Parts

Seal kit

Design	Dimensions, number			Order number			
	O-ring	Square ring	Back-up ring				
Head valve size D 07 (16)	Standard - NBR	22.22 x 2.62 (4 pcs.)	-	-	487-9901		
		10.82 x 1.78 (2 pcs.)					
		31.42 x 2.62 (2 pcs.)					
	Viton	22.22 x 2.62 (4 pcs.)			-	-	487-9902
		10.82 x 1.78 (2 pcs.)					
		31.42 x 2.62 (2 pcs.)					
Throttle valve 2VS3-06-CS type number 525-0023	Standard - NBR	18 x 2.65 (2 pcs.)	9.25 x 1.68 (4 pcs.)	6.73 x 9.43 x 1.14 (2 pcs.)	525-9900		
		6.9 x 1.8 (2 pcs.)		17.83 x 22.19 x 1.14 (2 pcs.)			
	Viton	17.12 x 2.62 (2 pcs.)	-	9.43 x 6.73 x 1.14 (2 pcs.)	525-9940		
		9.25 x 1.78 (4 pcs.)		17.83 x 22.19 x 1.14 (2 pcs.)			
		6.75 x 1.78 (2 pcs.)		-			
	Control valve	see data sheet ARGO-HYTOS - HU 4010 - RPE3-06 and HU4035 - RPEW4-06					

Bolt kit

Fixation of extension of valve	Dimensions, number		Bolt torque	Order number
	Bolt M5 x 45 - DIN 912-10.9 (4 pcs.)		6.6 ft-lbs (8.9 Nm)	484-9958
	Bolt M5 x 98 - 8G			760-0072
	Nut M5			

Other

	Design	
Cover plate	PA, BT	525-0084
	PB, TA	525-0079

Notes:

- Service valve without range stated parameter consultation with manufacturer.
- Detail information at control valve - see data sheet RPE3-06, HU 4010 and RPEW4-06, HU 4035.
- The plastic packaging is recyclable.
- Certified documentation is available per request.

ARGO - HYTOS INC.



P.O. Box 28; Bowling Green; Ohio 43402
 Phone: 419-353-6070; Fax: 419-354-3496
 info.us@argo-hytos.com; www.argo-hytos.com

