ENGINEERING FLOW SOLUTIONS

PROTECTION & CONTROL PANELS

HMS Control ST series

HMS Control ST series
Panel for up to 4 pumps

APPLICATION

The HMS Control ST panels are intended for control and protection of up to 4 surface installation centrifugal pumps (doble suction, overhung, etc.) and their analogs at the water supply systems, pressure boosting stations, and water lifting stations of the second or third lift.

The panel provides operation of the pumping unit in manual, automatic and remote modes.

REGULATION METHODS

The panel maintains automatically the preset parameters of the water supply system by the following regulation methods:

- Cascade regulation: a certain number of pumps with fixed rotation speed is switched on/off to maintain operation pressure in the system.
- Cascade / frequency regulation: a single frequency inverter regulates the rotation speed of one pump and depending on the required performance a certain number of additional pumps with fixed rotation speed is switched on /off.
- Frequency regulation: a frequency inverter on each pump allows the panel to maintain the system parameters by independent regulation of each pump rotation speed.

MAIN FUNCTIONS

- Coordinated operation of pumps to maintain the water supply system parameters, increase pumping units efficiency, operational lifetime and reliability of the pumping system in general.
- Energy saving by 10-40% in comparison with systems regulated by the valves.
- Automatic start of the standby pump in the event of the main pump failure.
- Uniform total running time provided by periodical switching between main and standby pumps.
- Automatic switching to reserve power supply (option). In the event of the voltage drop at the main power line the panel switches to a reserve power line (if provided) to continue operation in a preset mode.

- Valves drives control (option). In automatic mode before switching on of appropriate pump the panel opens the suction valve and in a certain period of time opens the discharge valve.
- User-configurable analog/digital input/output signal lines provides easy adaptation of the panel to a specific control system (see the options listed in the «Technical parameters» section).

PUMP AND MOTOR PROTECTION FEATURES

- Pump shutdown at absence of water in the suction pipeline or a storage tank (dry running)
- Thermal and maximum current protection of the electric motor
- Pump shutdown at low power supply voltage quality, phase break, distortion, wrong sequence
- Motor shutdown by the temperature cut-off switch (option)
- Motor and pump parts temperature control (option, RT100/RTS sensor required)
- Pump shutdown in case of external accident
- Emergency shutdown at an excessive value of adjustable parameter
- Pumping station shutdown at rapid pressure drop in the suction pipeline (e.g. pipeline breakthrough)
- Limiting the number of starts per hour

INTERFACE

Items located on the control panel door:

- Selector of operation mode for each pump (Manual - 0 - Automatic)
- Buttons of manual start/stop of electric motors
- Pump mode indicators: «Network», «In operation»
- Emergency indicator for each pump
- Voltmeter displaying values of supply voltage (option)
- Ammeter displaying value of current consumed by each pump (option)

Controller display menu items:

- Current value of the adjustable parameter and preset value
- Status of connected sensors
- Alarms and emergency signals
- Total running time of each pump
- Total number of starts for each motor
- Failures log

PANEL DESIGNATION

Example:
HMS Control ST–25–3–KFS–AVR.T.A–IP54

HMS Control ST - XXX - X - XXX - X.X.X - IP54

Panel series

Pump maximum rated current, A

Number of connected pumps

Regulation type and pump starting method (for unregulated pumps):

K – cascade regulation, **KS** – cascade regulation + soft start
KF – cascade-frequency regulation, **KFS** – cascade-frequency regulation + soft start
F – frequency regulation

Options (if applicable):

AVR – Double power feed with automatic reserve switching device
T – Motor winding temperature sensor, **M** – Voltage surges protection
V – Voltmeter at the panel's input feed, **A** – Amperemeter for each pump
C – Connection by Modbus protocol
1E, 2E – Valve drive control (a digit means number of operated drives)
P – User-configurable digital input/output

Panel casing protection

TECHNICAL DATA	
Voltage	3x380 V (+10%, -15%), 50 Hz, N, PE
Number of connected pumps	1...4
Motor rated current	1...320 A
Motor power	up to 160 kW
Regulation method	cascade, cascade-frequency, frequency
Starting method for unregulated motors (without frequency inverters)	direct-on-line or soft start
Rated current for a valve drive (optional)	up to 9 A
Ambient temperature range	+1...+40°C
Air humidity	80% at 25°C
Cables inlet	bottom
Analog signal input (4…20 mA)	pressure sensor

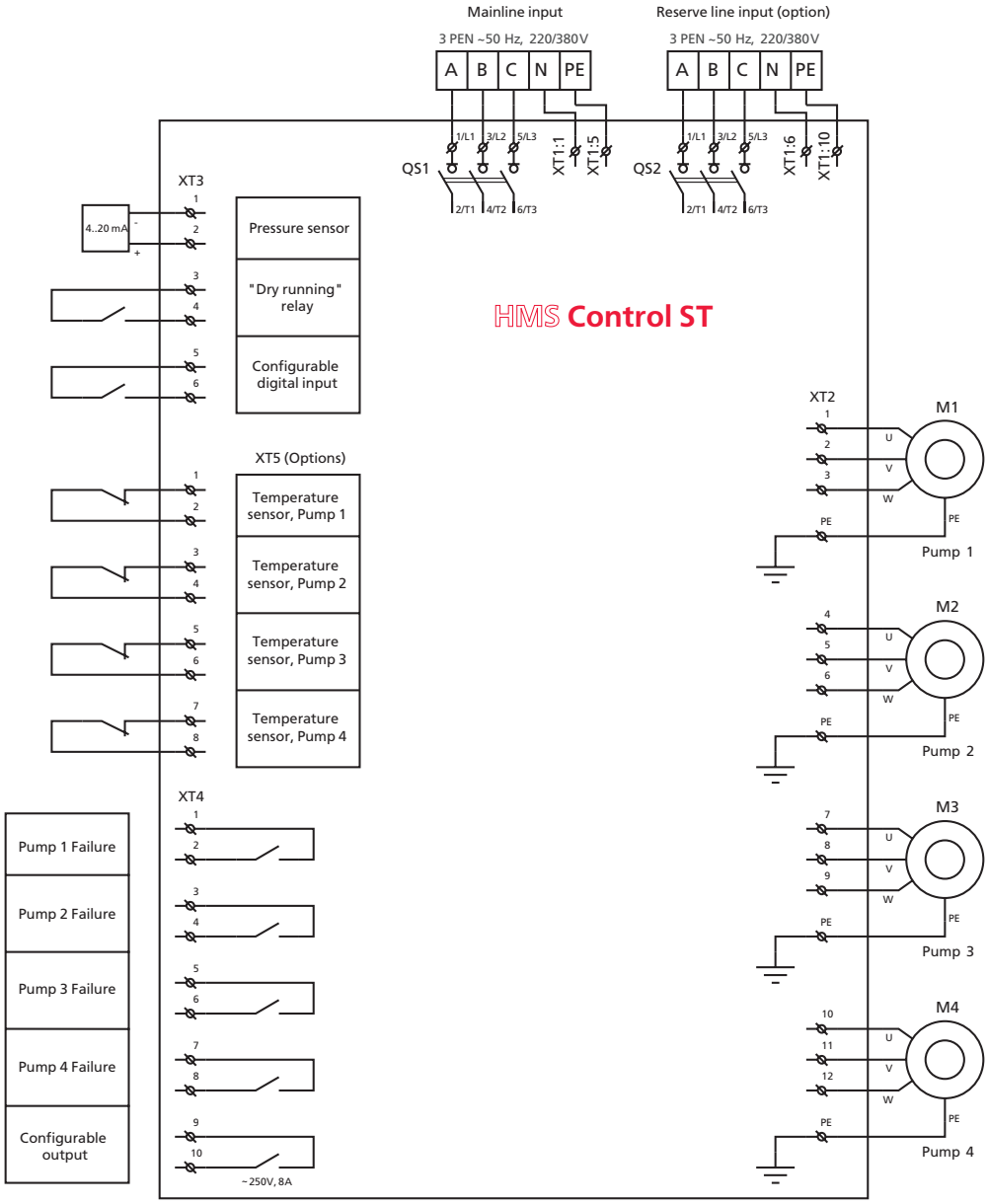
Digital input signals	Digital output signals
1. Dry running sensor **2. Built–in motor winding temperature sensor (option)** **3. Configurable inputs:** — Panel remote start/stop — Remote reset of alarm — «External failure» — Liquid flow meter relay — Customized function (option)	**1. «Pump failure» (for each pump)** **2. Configurable outputs:** — «General failure» — «Panel in operation» — «Automatic mode» — «Dry running» — Customized function
Sensors circuit voltage: 24 V, DC	NO-contact relay (250 V, 8 A)

STANDARD VERSIONS

	Panel designation		Motor rated current, A	Motor rated power, kW
	DOL start	Soft start		
Panels with cascade regulation	HMS Control ST-4-...-K -IP54*		2.5...4	1.5
	HMS Control ST-6-...-K -IP54		4...6.3	2.2
	HMS Control ST-10-...-K -IP54		6...10	3; 4
	HMS Control ST-14-...-K -IP54	HMS Control ST-14-...-KS -IP54	9...14	5.5
	HMS Control ST-18-...-K -IP54	HMS Control ST-18-...-KS -IP54	13...18	7.5
	HMS Control ST-23-...-K -IP54	HMS Control ST-23-...-KS -IP54	17...23	9
		HMS Control ST-25-...-KS -IP54	20...25	11
		HMS Control ST-32-...-KS -IP54	24...32	15
		HMS Control ST-40-...-KS -IP54	30...40	18.5
		HMS Control ST-50-...-KS -IP54	37...50	22
		HMS Control ST-65-...-KS -IP54	48...65	30
		HMS Control ST-80-...-KS -IP54	63...80	37
		HMS Control ST-100-...-KS -IP54	80...100	45
		HMS Control ST-120-...-KS -IP54	95...120	55
		HMS Control ST-140-...-KS -IP54	110...140	75
Panels with cascade–frequency regulation	HMS Control ST-4-...-KF -IP54		2.5...4	1.5
	HMS Control ST-6-...-KF -IP54		4...6.3	2.2
	HMS Control ST-10-...-KF -IP54		6...10	3; 4
	HMS Control ST-14-...-KF -IP54	HMS Control ST-14-...-KFS -IP54	9...14	5.5
	HMS Control ST-18-...-KF -IP54	HMS Control ST-18-...-KFS -IP54	13...18	7.5
	HMS Control ST-23-...-KF -IP54	HMS Control ST-23-...-KFS -IP54	17...23	9
		HMS Control ST-25-...-KFS -IP54	20...25	11
		HMS Control ST-32-...-KFS -IP54	24...32	15
		HMS Control ST-40-...-KFS -IP54	30...40	18.5
		HMS Control ST-50-...-KFS -IP54	37...50	22
		HMS Control ST-65-...-KFS -IP54	48...65	30
		HMS Control ST-80-...-KFS -IP54	63...80	37
		HMS Control ST-100-...-KFS -IP54	80...100	45
		HMS Control ST-120-...-KFS -IP54	95...120	55
		HMS Control ST-140-...-KFS -IP54	110...140	75
Panels with frequency regulation	HMS Control ST-4-...-F -IP54		2.5...4	1.5
	HMS Control ST-6-...-F -IP54		4...6.3	2.2
	HMS Control ST-10-...-F -IP54		6...10	3; 4
	HMS Control ST-14-...-F -IP54		9...14	5.5
	HMS Control ST-18-...-F -IP54		13...18	7.5
	HMS Control ST-23-...-F -IP54		17...23	9
	HMS Control ST-25-...-F -IP54		20...25	11
	HMS Control ST-32-...-F -IP54		24...32	15
	HMS Control ST-40-...-F -IP54		30...40	18.5
	HMS Control ST-50-...-F -IP54		37...50	22
	HMS Control ST-65-...-F -IP54		48...65	30
	HMS Control ST-80-...-F -IP54		63...80	37
	HMS Control ST-100-...-F -IP54		80...100	45
	HMS Control ST-120-...-F -IP54		95...120	55
	HMS Control ST-140-...-F -IP54		110...140	75

* a digit in place of ellipsis (...) shows number of pumps to be connected to the panel

CONNECTION SCHEME



HYDROMASHSERVICE is an integrated commercial and engineering company of the HMS Group.
Please forward your queries to below contact details:

12, Aviakonstruktora Mikoyana str.,
Moscow, 125252, Russia

Phone: + 7 (495) 664 8171
Fax: + 7 (495) 664 8172

e-mail: hydro@hms.ru
www. hms.biz

HMS 108E 21072014 RUS