Wilo COR MVI Booster Systems

COR MVI Booster Systems – March, 2013

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Agenda

1. General Features and Benefits
2. General Technical Specifications
3. Model Number Designation
4. Performance Data
5. Detailed Technical Features / Construction Details
6. Control Panel - Features and Benefits
7. Control Panel – Technical Specifications
8. Software
9. Product Benefits / Functions

Features and Benefits

Sizes / Series

		Pressure Differential Feet	Pressure Differential PSI				
		75	32	COR-2-MVI-1502/	MVI 1502	1	1" NPT Oval
		110	48	COR-2-MVI-1503/	MVI 1503	1	1" NPT Oval
		155	67	COR-2-MVI-1504/	MVI 1504	1 1/2	1" NPT Oval
COR MVI 15 Series		200	87	COR-2-MVI-1505/	MVI 1505	2	1" NPT Oval
Total Nominal Flow	# Pumps	240	104	COR-2-MVI-1506/	MVI 1506	2	1" NPT Oval
15	1	260	113	COR-2-MVI-1507/	MVI 1507 R	3	1 1/4" 250# RF
30	2	305	132	COR-2-MVI-1508/	MVI 1508	3	1 1/4" 250# RF
45	3	395	171	COR-2-MVI-1510/	MVI 1510	5	1 1/4" 250# RF
60	4	430	186	COR-2-MVI-1511/	MVI 1511	5	1 1/4" 250# RF
		470	203	COR-2-MVI-1512/	MVI 1512	5	1 1/4" 250# RF
		540	234	COR-2-MVI-1514/	MVI 1514	5	1 1/4" 250# RF
		70	30	COR-2-MVI-3002/	MVI 3002	1	1 1/4" NPT Oval
		100	43	COR-2-MVI-3003/	MVI 3003	1 1/2	1 1/4" NPT Oval
		140	61	COR-2-MVI-3004/	MVI 3004	2	1 1/4" NPT Oval
COR MVI 30 Series		175	76	COR-2-MVI-3005/	MVI 3005 R	3	1 1/4" 250# RF
Total Nominal Flow	# Pumps	215	93	COR-2-MVI-3006/	MVI 3006	3	1 1/4" 250# RF
30	1	260	113	COR-2-MVI-3008/	MVI 3007	5	1 1/4" 250# RF
60	2	290	126	COR-2-MVI-3008/	MVI 3008	5	1 1/4" 250# RF
90	3	350	152	COR-2-MVI-3010/	MVI 3010	7 1/2	1 1/4" 250# RF
120	4	445	193	COR-2-MVI-3012/	MVI 3012	7 1/2	1 1/4" 250# RF
		500	216	COR-2-MVI-3014/	MVI 3014	7 1/2	1 1/4" 250# RF
		80	35	COR-2-MVI-5002/	MVI 5002	2	1 1/2" NPT Oval
		120	52	COR-2-MVI-5003/	MVI 5003	3	2" 250# RF
COR MVI 50 Series		170	74	COR-2-MVI-5004/	MVI 5004	5	2" 250# RF
Total Nominal Flow	# Pumps	215	93	COR-2-MVI-5005/	MVI 5005	5	2" 250# RF
50	1	260	113	COR-2-MVI-5006/	MVI 5006	7 1/2	2" 250# RF
100	2	290	126	COR-2-MVI-5007/	MVI 5007	7 1/2	2" 250# RF
150	3	325	141	COR-2-MVI-5008/	MVI 5008	7 1/2	2" 250# RF
200	4	425	184	COR-2-MVI-5010/	MVI 5010	10	2" 250# RF
		470	203	COR-2-MVI-5011/	MVI 5011	10	2" 250# RF
COR MVI 80 Series							
Total Nominal Flow	# Pumps	80	35	COR-2-MVI-8002/	MVI 8002	3	2" 250# RF
80	1	130	56	COR-2-MVI-8003/	MVI 8003	5	2" 250# RF
160	2	175	76	COR-2-MVI-8004/	MVI 8004	7 1/2	2" 250# RF
240	3	215	93	COR-2-MVI-8005/	MVI 8005	7 1/2	2" 250# RF
320	4	265	115	COR-2-MVI-8006/	MVI 8006	10	2" 250# RF

General Features and Benefits

Scope of Supply

- Fully self-contained, factory assembled and tested, (control functions and pressure) ready-to-connect pressure boosted system.
- Installer simply positions the system, connects the inlet/outlet piping to the header/manifold assemblies and wires the incoming power to the control panel.

Applications

- Pressurized water supply and water pressure boosting in residential, commercial and public buildings, hospitals, hotels, department stores, sports facilities, and irrigation systems
  - Excessively high or heavily fluctuating inlet/suction pressure will require installation of a pressure reducing valve to maintain a constant inlet pressure level

Approved Liquids

- Potable and domestic water, chilled water, or other water
  - Fluids which do not chemically or mechanically attack pump wet end materials and are free of abrasive or fibrous matter

Excellent Commercial Pump Warranty

- 24 months from date of purchase

General Technical Specifications

Performance

• Flow	max. 420 US GPM
• Head (boost pressure)	max. 540 ft (210 psi)
• Fluid temperature	max. 150°F (70°C)
• Number of pumps	2, 3, or 4
• Pump rated speed	3450 RPM
• Inlet pressure	max. 145 psi
• Working pressure	max. 250 psi
• Header/manifold sizes	2”, 2 ½”, 3 NPT, 4” 250 psi ANSI flanged (model dependent)
• Ambient temperature	max. 90°F (40°C)
• Available voltages	3 phase – 208-230, 460, 575V

Model Number Designation

COR-4 MVI 8004

CO

- Compact Booster System

R

- Auto speed control of the current base-load pump by frequency converter

4

- Number of Pumps

MVI

- Vertical Multi-Stage, 304SS Pump Series

8004

- 80 - Rated flow Q (US GPM) of single pump
- 04 – Number of stages of each pump

Performance Data

COR-2 MVI

- With pump series MVI 15 / 30 / 50 / 80
- Nominal flow range: 30 to 160 US GPM

COR-3 MVI

- With pump series MVI 15 / 30 / 50 / 80
- Nominal flow range: 40 to 240 US GPM

COR-4 MVI

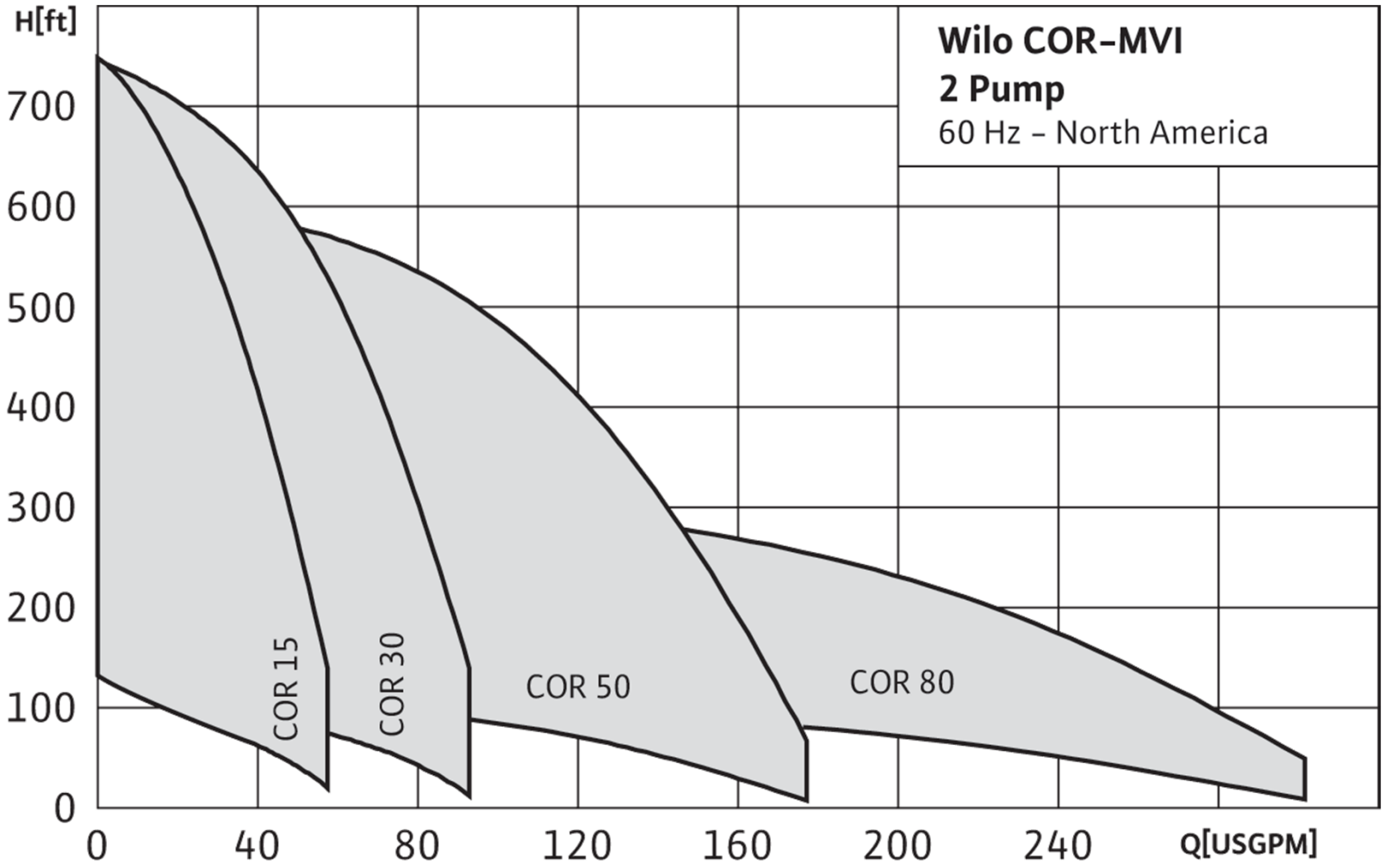
- With pump series MVI 15 / 30 / 50 / 80
- Nominal flow range: 60 to 320 US GPM

Performance Data

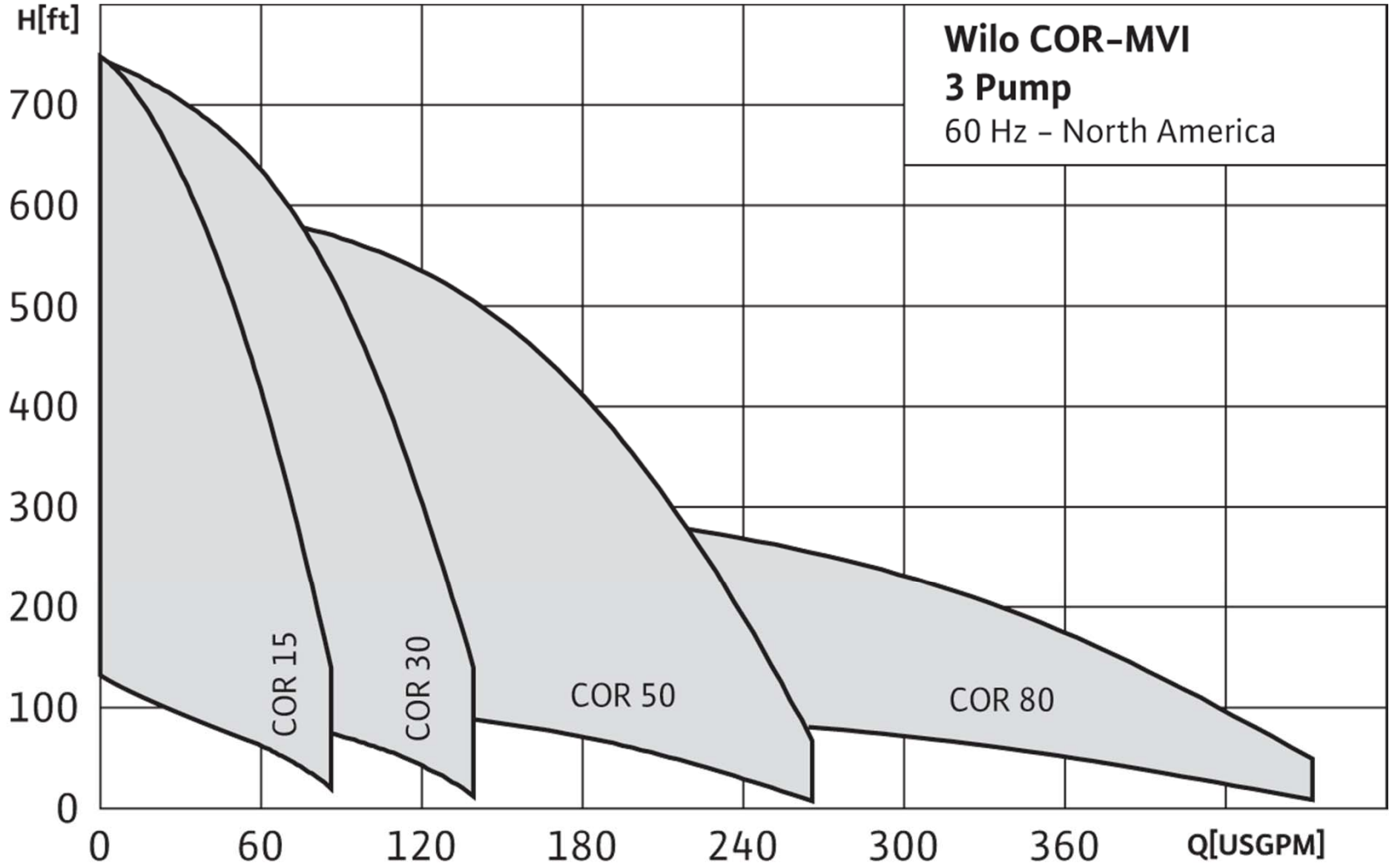
Boost Pressures at Nominal Flow Rate

- MVI 15 Series: 32 to 234 psi
- MVI 30 Series: 30 to 216 psi
- MVI 50 Series: 35 to 203 psi
- MVI 80 Series: 35 to 115 psi

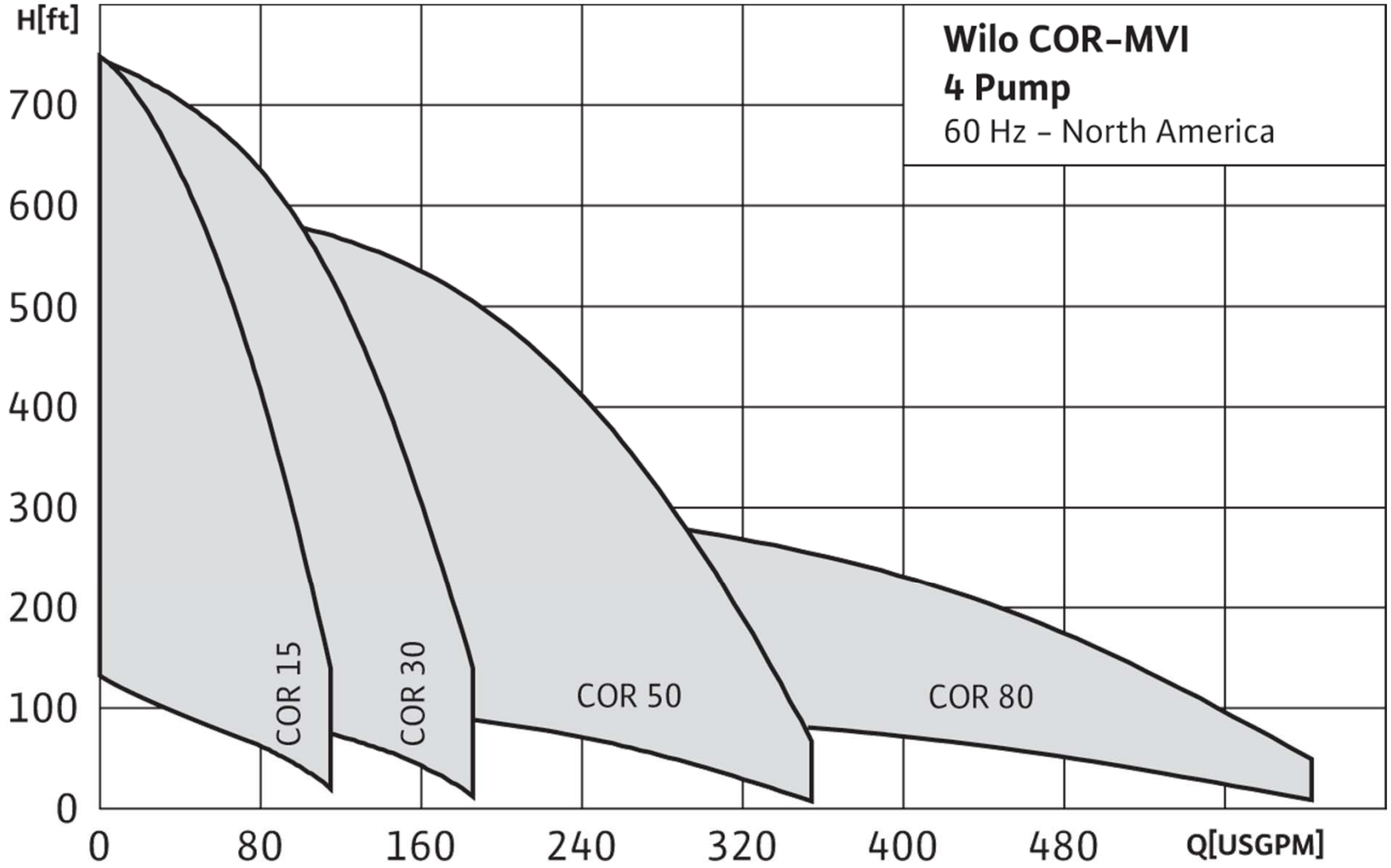
Family Curves – COR-MVI-2 Pumps (3450), 60 Hz



Family Curves – COR-MVI-3 Pumps (3450), 60 Hz



Family Curves – COR-MVI-4 Pumps (3450), 60 Hz



Detailed Technical Features

- **Materials of Construction**
  - Fully assembled, tested, and programmed UL and cUL approved packaged systems
  - Pumps:
    - 2, 3, or 4 assembled pumps in parallel operation
    - MVI 15 / 30 / 50 / 80
    - 208/230, 460, 575V /3 phase / 60 Hz
    - All wetted parts: AISI 304 SS (1.4301 Stainless Steel)
  - Base Plate:
    - Galvanized steel grout type
    - Vibration isolation pads included
    - Salt spray tested to be free of white rust for at least 175 hours and red rust for at least 300 hours

Detailed Technical Features

- **Materials of Construction**
  - Header / Manifold Assemblies:
    - 304 Stainless Steel
  - Check Valves:
    - 316 Stainless Steel
  - Isolation Ball Valves:
    - Lead-free Bronze, NSF-61 Annex G approved
  - Control Panel
    - Powder-coated carbon steel
    - VFD for base load pump supplied
    - Sensors included
    - Interconnecting wiring

Detailed Technical Features

- **Construction Features**
  - Expansion Tank:
    - 2 US Gallon capacity
    - Installed on the discharge header/manifold
    - Butyl-rubber diaphragm: NSF-61, Annex G and food grade compatible
    - Rated pressure to 250 psi
  - Pressure Sensor:
    - 4 to 20 mA pressure sensor
    - Installed at the discharge header/manifold to sense system pressure
    - Delivers pressure feedback to the controller

Detailed Technical Features

- **Construction Features**
  - Pressure Gauges:
    - Installed on suction and discharge headers/manifolds
    - Suction gauge: 0-100 psi
    - Discharge gauge: 0-300 psi
    - Liquid-filled
    - 4” face

Control Panel – Features and Benefits

- **CC-Controller for Pressure Boosting Systems**
  - Considerable energy savings due to the right pressure and operation only as required
  - Comes with integrated frequency drive (VFD) which adapts to actual demand
  - Easy operation by means of programmable logic controller
    - Therefore, can be adapted to any pressure boosting application.
  - Large, 3-color multiple language touch screen display for programming, operation and diagnostics

Control Panel – Technical Specifications

- **Fault Signals**
  - Fault event – the touch display will turn red
    - Alarm signal will be generated
  - Maintenance staff can be informed via SMS text message or email.
    - Fault acknowledgment is done via mobile phone – optional.

Software

- Automatic fault-actuated changeover from duty pump to standby pump
- Alternation of base load pump by pressure and time
- Fault logging of the last 35 individual messages
- Service menus for diagnostic checks
- 7-day programming mode for systems requiring a second pressure level (similar to setback)
- Easy commissioning due to custom factory application specific set-up
- Operating on variable frequency control
  - The base load pump conducts a “speed bump” momentarily lowering its speed
  - The system looks for zero pressure change – meaning no system flow demand (head and flow check every 3 minutes)

Product Benefits

- **Fault Signals**
  - Fault event – the touch display will turn red
    - Alarm signal will be generated
  - Maintenance staff can be informed via SMS text message or email.
    - Fault acknowledgment is done via mobile phone – optional.

Product Benefits

- Touch screen provides maximum ease of control and operation
- Menu with plain text in 3 different languages (English, French and Spanish)
- Pump and system status and the current system pressure are displayed in the touch screen at all times
- Fully automatic control of 2 to 4 pumps with frequency converter via 4-20mA sensor with sensor line break detection
- Touch screen has 3 different backlighting colors to indicate system status (OK, warning and fault)
- Three password-protected levels of system access
- Optionally, fault/alarm messages can be output via SMS to up to 4 mobile telephones, or transmitted to other communication tools (i.e. To a computer via the Internet)
- Remote fault reset via mobile telephone
- Fault history memory stores up to 35 individual messages

Product Benefits

- Connectable BUS systems are possible via optional modules
  - CANBus, ProfiBus, ModBus, Ethernet, LON
- Bar graph display of measured values
- Measured value simulation program
- Emergency pump operation without PLC
- Selectable test run can be scheduled as desired
- Elapsed time indicator for each pump and system
- Automatic changeover to standby pump when there is a fault of an operating pump
- Monitoring of minimum and maximum system pressure with adjustable time transitions

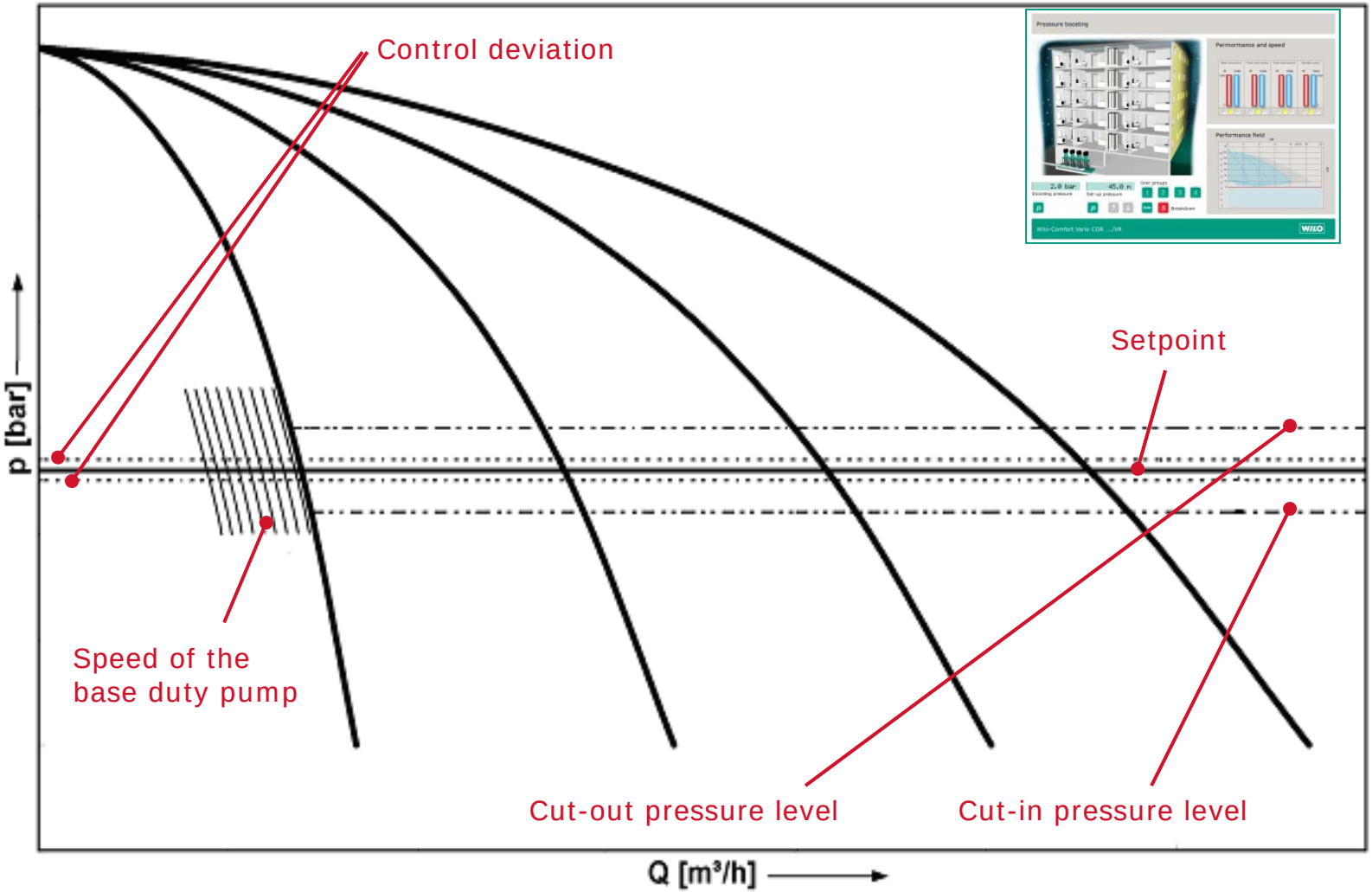
Functions

- **Unit Functions**
  - Wilo pressure booster systems are controlled and managed by the COR Comfort Controller in conjunction with the respective pressure sensors
  - The pumps are started and stopped in cascade mode in response to flow demand variations
    - Accomplished by pressure-deviation within the range between the set pressure levels
  - Dividing the unit capacity across a number of small pumps ensures constant adaption to the actual varying flow demand requirements within the limits of the set pressure levels

Functions

- **Comfort System Functions**
  - Immediate start (without any time delay) of the booster system takes place when the system pressure drops below the switch ON level p_{on}
  - Soft start is accomplished via the frequency-converter-controlled base load pump
  - If the system flow demand exceeds the maximum flow @ maximum speed of the base load pump (causing a slight decrease in system pressure), the second (or third, or fourth) pump comes to full speed and the base load pump ramps down
  - Final switch OFF will occur at flow=0
    - Controlled by the microprocessor
  - Water hammer is eliminated due to VFD operation

Functions


Control deviation
Setpoint
Speed of the
base duty pump
Cut-out pressure level
Cut-in pressure level
p [bar]
Q [m³/h]

Questions / Comments?