

# Metacentre™ XC – T39.3

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Identification:	Metacentre™ XC
Part number:	Refer to Product guide / price list for specific part number or contact dealer
Product Family:	Metacentre™
Function:	Central management control & monitoring of air / gas compressors Optional integrated control / monitoring of ancillary compressed air equipment
Definition:	Narrow pressure band controller with enhanced software features & functions
Capacity:	2 - 24 air / gas compressors located in up to 3 compressor locations & Metacentre™ ancillary product control / monitoring via optional Metacentre™ I/O & sensor options
Compressor connectivity:	<b>Airbus</b> ™ communication protocol
Supported protocol:	<b>Airbus</b> ™ & Modbus RTU via dedicated network gateway
Software:	Pre-programmed application software, configurable via password protected operator interface
Product overview:	

As demand for compressed air fluctuates and as system pressure decays or increases in response to that demand, Metacentre™ compressor management systems ensure that site wide compressors and ancillary compressed air equipment are harnessed as 1 to obtain an equilibrium where efficiency, equipment utilisation and system pressure are in perfect balance. In unmanaged compressed air systems that equilibrium represents a significant energy & cost saving opportunity.

Metacentre™ XC is a specialised supervisory control product designed to provide energy efficient optimised narrow pressure and priority management control of up to 24 air / gas compressors located in up to 3 compressor locations & operating in a common compressed air / gas system.

Metacentre™ XC's general operating mode can be modified via a number of adjustable parameters enabling its control strategy to align with / optimise available compressed air equipment and site specific installation characteristics.



### Features & Functions:

The primary function of the Metacentre™ XC pressure control strategy is to maintain system pressure between the 'High Pressure' set point & the 'Low Pressure' set point in conjunction with targeting energy efficiency through optimal compressor utilisation. The XC calculates a 'Target' pressure level which is used as the nominal 'target' pressure level for the system. Rate of change in pressure, is largely determined by system volume and the scale, and/or abruptness, of air demand fluctuations; these characteristics will differ from installation to installation. To accommodate for variations in installation characteristics the 'Tolerance' pressure level (TO) and an influence on the dynamic reaction time (or 'Damping') of the XC is adjustable.

### System building capability:

Metacentre™ XC's system building capability is considerable. There's a dedicated 'start function' enabling auxiliary equipment to be pre-started prior to utilisation of any compressors. There's a second 'back-up control pressure sensor' analogue input and further analogue inputs dedicated to 'air treatment differential' monitoring and 'air flow' monitoring. Metacentre™ XC is equipped with 10 dedicated 'digital' inputs, each having a defined function & 4 digital inputs that can be used as 'input functions' for any virtual relay.

Metacentre™ XC features 16 configurable 'virtual relays' of which 10 have 'physical' relay contact outputs; the function of 'physical' relays is determined by the set-up of the equivalent 'virtual relay'. As if all that was'nt enough, we've added the ability to add up to 12 ancillary I/O modules to the Metacentre™ XC, collectively providing the ability to automate, control and monitor almost anything. There are literally millions of configuration possibilities!

Key product features:

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One touch & single pressure band technology narrowing site wide pressure to a minimum of 0.2bar



Table Technology that allows configuration and inter-utilisation of up to 6 separate compressor management & control strategies



Real time clock & pressure schedule adding necessary fine tuning and pressure optimisation capabilities



Remote I/O expansion. Add distributed intelligence to control / monitor equipment, sensors and automate functions



Intelligent pre – Fill, set required system pressure, when you want it and let Metacentre<sup>TM</sup> do the rest



Energy Control Mode, our most advanced control algorithm for efficient compressor system management & control.



Multiple VSD control & optimisation technology, as the use of variable speed drive increases its increasingly important to question what binds the equipment together? Our advanced software algorithms ensure VSD load optimisation is assured



Start function, a system building feature that integrates the starting of ancillary equipment such as pumps and air treatment equipment (see detailed feature description below).



Zone Control. When your compressors are distributed in multiple locations, you need a Management system that understands where they are.



Remote pressure balance. When your distribution pipework causes pressure imbalance between Zones, Metacentre<sup>TM</sup> has been designed & engineered to overcome this



Virtual relay automation technology brings all the benefits of 'PLC style' automation within a focused & intuitive application environment.



For added peace of mind a back up control pressure sensor can be added. Where air treatment differential is a consideration, this too can be monitored. Lastly, if air flow monitoring is to be of interest, the flow sensor can be connected to a dedicated input on the Metacentre<sup>TM</sup>

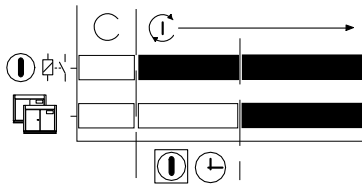
Key product features explained:

 Start function

The 'Start' function enables auxiliary equipment to be pre-started prior to utilisation of any compressors. The function also monitors the auxiliary equipment during normal running operation.

At system start-up (manual start or automated start from standby) any output relay set for the 'Start' function will energise. The management system will then wait for the set 'Start' time before utilising any system compressors.

During this time the management system expects to receive a feedback on the 'Start Function Feedback Input'. The Metacentre™ XC response to the feedback is dependent on the selected 'Start' function.



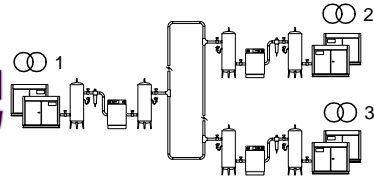
If feedback is not received by the end for the 'Start' time the management unit can be set to display an Alarm (Warning) and continue, or Shutdown.

If, at any time during normal operation, the feedback signal disappears the management unit can be set to display an Alarm (Warning) and continue, or Shutdown.

This function is intended for automated control and monitoring of auxiliary equipment critical to air compressor system operation; air dryer(s) or cooling water pump(s) for example.

Zone Control Function:

Compressors can be assigned to one of three 'zones'. The Metacentre™ XC will always attempt to balance utilisation across the zones to maintain, as near possible, an equal number of utilised compressors in each zone.



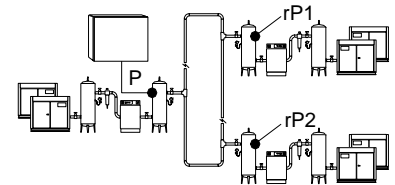
This function is intended for installations that have multiple compressor locations.

In some instances, large pressure differentials can exist in remote areas of an air distribution network if generation is concentrated in one area. The aim of the 'zone' function is to facilitate a balanced pressure across a site air network by ensuring air generation is distributed.

Pressure Balance Function:

Metacentre™ XC has the capability to monitor up to two remote pressures from compatible compressor controllers, Metacentre™ compressor integration products or other compatible Metacentre™ product. The remote pressure(s) can be integrated with the primary local pressure to generate a new control pressure value.

This function can be used to 'balance' pressure control across a system that has multiple compressor locations and/or where a pressure differential across locations exists.



I/O & Virtual Relay automation

Metacentre™ XC is equipped with 10 defined function digital inputs

- |   |   |
|---|---|
| Digital input 1: Activates Table 3 when held closed   | Digital input 2: Activates Table 4 when held closed                         |
| Digital input 3: Activates Table 1 when held closed   | Digital input 4: Activates Table 2 when held closed                         |
| Digital input 5: Metacentre™ XC Start / Stop          | Digital input 6: Force sequence change                                      |
| Digital input 7: Force compressors to 'Standby' state | Digital input 8: Activates Table 5 when held closed                         |
| Digital input 9: Activates Table 6 when held closed   | Digital input 10: Start function feedback (closed = feedback, open = fault) |

(Where more than 1 'Activate table' digital input is closed, priority is given to the lowest (i.e. Table 1 = highest priority)

Metacentre™ XC is equipped with 4 additional 'digital' inputs used as 'input functions' for any Virtual Relay in the Metacentre™ XC or from a compatible Metacentre™ unit on the system network.

Metacentre™ XC features 16 configurable 'virtual relays', each relay can be separately configured. 'Virtual Relay' is a configurable system-wide automation concept that allows output relay functions to respond to any 'virtual relay' condition, status or signal function available in the Metacentre™ XC or from a compatible Metacentre™ unit on the system network.

Local (L) or Remote (R) : defined automatically

Function Type (A, T, S, R, F) : Alarm, Trip, Signal state, Relay state, Status function

**Fn = A BBB C DD**

System Unit (SYS, C01 – C12, B01 – B12) : location of function status information

Function Definition: Defines a specific input function (see function list)

Virtual relays have the capability to accept 2 input functions and apply 'logic' (IF, AND, OR, XOR) to determine the appropriate output response.

The 'normal' relay state plus delay ON & OFF are configurable parameters.

Metacentre™ XC is equipped with 10 'physical' relay contact outputs (R1 – R10). The function of each relay is determined by the set-up of the equivalent 'Virtual Relay'. For example R1 can activate Table 3 by connecting the output terminals of R1 to the 'Activates Table 3 input' terminals.

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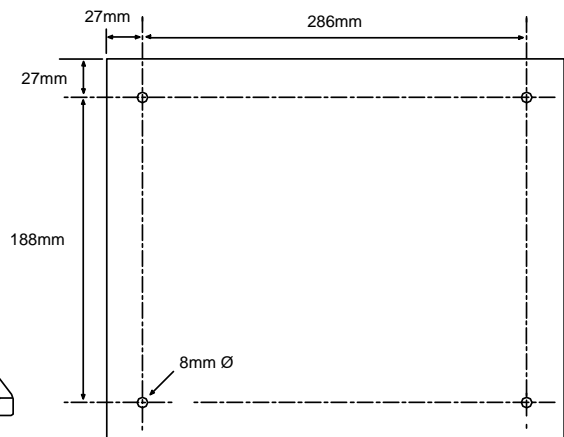
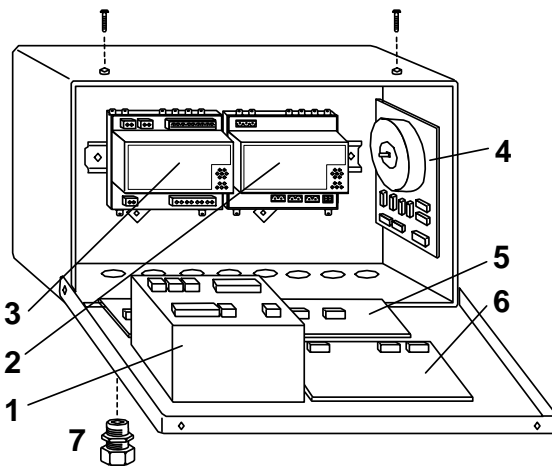
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Pressure ref: 4 – 20mA  
 Pressure scale: Configurable to 600bar  
 Processor: 16bit ST10 Micro-processor  
 Op. interface: 128 x 64 graphical back lit LCD plus XC & individual compressor / compressor group status indication panel

Real time clock: internal real time clock  
 Software: Pre-programmed application software, configurable via password protected operator interface

Protocol: **Airbus™ RS485** & Modbus RTU via dedicated network gateway  
 Modes of control: Fixed cascade mode,  Equal hours run,  Timer rotation,  Energy control mode  
 Tables: 6 operating parameter tables  
 Software features:  Intelligent pre-fill,  Sequence rotation,  Priority settings,  Pressure schedule  
 Auxiliary: 10 x Defined function digital inputs (see previous page for function list)  
 4 x Digital inputs for local or remote virtual relay assignment  
 16 x configurable 'virtual relays'  
 10 x 'physical' relay contact outputs

Ancillary I/O: YES, 12  
 Supply / Power: 230Vac +/- 10%, 115Vac +/- 10%, 100VA  
 Enclosure rating: IP54 / NEMA12  
 Dimensions: Height: 340mm (13.4") x Width: 241mm (11.45") x Depth: 152mm (6")  
 Access: Front, lockable, hinged access panel  
 Cable entry: Bottom, gland cable entry system  
 Weight: 7.5kg (16.5lb)  
 Mounting: Wall, 4 x screw fixing  
 Temperature: Min 0°C (32°F), Max +46°C (115°F)  
 Humidity: 95% RH non-condensing  
 Approvals: CE, UL, cUL



- |                     |                       |
|---------------------|-----------------------|
| 1 Unit, Controller  | 5 PCB, Terminal       |
| 2 Unit, XPM – PSU24 | 6 Unit, XPM – LED24   |
| 3 Unit, XPM – Di8R4 | 7 Gland, Set – PG13.5 |
| 4 Unit, XPM – TAC24 |                       |

