Air Handle

Technical manual 1.1 for AH lyftsystem P011 V1

TABLE OF CONTENTS

PNEUMATIC

Requirements

The equipment is delivered with a connection to a compressed air supply in form of a quick connect coupling (CEJN). The equipment needs 6 bar operating pressure of dry and clean compressed air. Check that the capacity is enough for the grippertool functions. The airsupply must be connected through a filter.

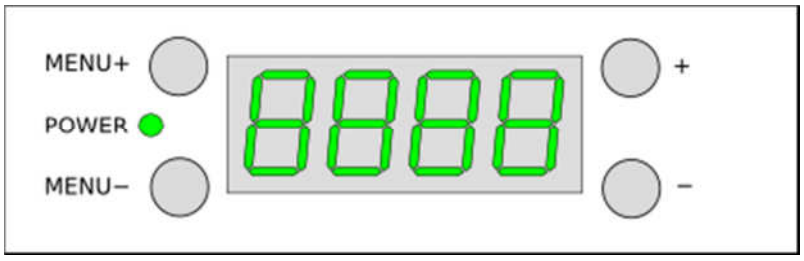
ELECTRICAL SUPPLY

Requirements

The equipment is delivered with a connector and must be connected through a circuit breaker. The electrical installation must be done by an authorized electrician – one (1) phase 100-240VAC, min 1.3A, 50/60Hz. Circuit breaker and installation is the customers responsibility.

OPERATION – DISPAY AND BUTTONS

The dispay is lit when the system power supply is on. In normal mode the display looks like in the picture to the right. When looking up a status or parameter the display will change and show a status/parameter, if the system is leaved unattended the display will revert to normal mode in approx 4 minutes.



Display		Comment
P011	Power up	Shows version number for approx. 1sec after power supply is turned on.
--99 --99 --99 --99	**Normal display**	The minus signs displayed in front of the digits indicate signal from the handle. In the middle = no signal At the top = up signal At the bottom = down signal The two digits counts from 99 to 0 when the lift is in use. After 250.000 lifts the counter reaches 0 and the lift will stop. See “Err1” below.
S80	Menu +/-	To see the status registers you first press ”Menu+” and steps upward in the registers with ”Menu+” and downward with ”Menu-” (assuming that normal

Alt **0180**		mode is shown before entering register view). The first two digits alternates in showing a “S”, as in Status, and the Status register number. The last two digits shows current value – see the list below Menu+ and – buttons browse the registers
P00 **Alt** **0100**	Menu +/-	To see the parameter registers you first press ”Menu-” and steps downward in the registers with ”Menu-” and upward with ”Menu+” (assuming that normal mode is shown before entering register view). The first two digits alternates in showing a “P”, as in Parameter, and the Parameter register number. The last two digits shows current value – see the list below Menu+ and – buttons browse the registers + / - buttons changes the value
Err1	Error	This message means that maintenance shall be done. After 250.000 lifts, the program will and display ”Err1”. If the system is restarted the lift can be used normally for another hour – this goes on until the system is reset, i.e. parameter 12 is set to 55. Set parameter 12 to 55 and leave the system on, after approx 4 minutes the display will revert to normal mode and the downcounter will start to show 99 percent and parameter 12 is automatically set to 0(zero).

Status register

Status nr	Status name	Value	Comment
S01	LiftPressure	00..60	Shows the air pressure in the lifting system (0..60 = 0..6 bar)
S02	24VSupply	20..30	Shows power supply voltage (normaly 24..28 VDC)
S03	Services	0..	Shows the total number of wire exchanges (or maintenance occasions) that has occurred
S04	Diagnose	…	Shows different values depending of set value of parameter 17

Parameters

Param. nr	Parameter name	Range	Default value	Comment
P01	DeadBand	05..40	10	Sets dead band for the handle – i.e. sensitivity around 0
P02	Balancing	00 01-99	0	0 = No balancing, otherwise this is the time from when handle signal is zero to the hoist to balance. (0.01 – 0.99 sec). When hoist is balanced up/down, movement can be done by holding the load and pull/push it in the desired direction.
P03	ReleaseOk	0..99	6	Interlock, the pressure in the lift system must be under this value to allow “Grip release” (0=release at any time, 1..99 = 0.1..9.9 bar)
P04	GripPulse	01..99	20	Sets pulse length for ”close grip” (0-5 sec, time = display value x 50 ms)
P05	ReleasePulse	01..99	20	Sets pulse length for ”open grip” (0-5 sec, time = display value x 50 ms) Can be used with a free blow valve in a vacuum gripper tool
P06	GripOk	00 01	1	Give GripOk when signal is high Give GripOk when signal is low
P07	ButtonFunction	00 01	0	Normal button function, toggle function. Grip on and off (release). Three functions. 1. Blow/float mode for vacuum tools 2. Grip function on 3. Grip function off (release)
P08	MaxPressure	00..60	60	Sets max air pressure in lift system (3..6 bar) – Can be used

				to limit the lifting force
P09	HandleInvert	00 01 02 03	0	Normal Handle signal less sensitive around neutral position Invert the handle signal, if the handle is used “upside-down” Inverted as above but the handle signal less sensitive around neutral position
P10	Resonance	00..48	0	Resonance filter, filters mechanical resonances up to 1 oscillation / 960ms
P11	SupplyPressure	60..99	99	Set to nominal air pressure supply (60..99 = 6 .. 9.9 bar)
P12	ServiceReset		0	When set to 55, this resets the lift counter, this must be done when the counter has reached 0(and wire replaced) or if wire is replaced before counter has reached 0
P13	DownwardGain	1..99	50	Increase (high value)/decreas gain downward (speed)
P14	UpwardGain	1.99	50	Increase (high value)/decreas gain upward (speed)
P15	BrakeOutput	1.99	10	Time in percent of 127ms – 12750ms 10% = 1,27 seconds 0=inactive When there is no signal from handle/balance this output will be deactivated after n seconds, as soon as a signal from handle/balance is detected the output will be activated NOTE the output is **active low**.
P16	BalanceLimit	0..99	4	Controls when to switch to high flow valve when balanced, if balance value is below this value the low flow valves is used and over the high flow valve (low flow will be off) A value of 0 means that only high flow valves is used and if setting this value high (+70), the balance value will never reach this limit thus only allowing low flow valve to be

				active
P17	SetDiagnose	0..15	0	See section Diagnos by display in the Troubleshooting manual

Program features

- At power up the system checks if the internal system pressure is over parameter P03 (if this is set to otherwise than 0), if the pressure is higher the system itself will activate the Grip function in a try to secure the load. The controller system also sets the correct sequence regarding the button mode which is used i.e. toggle or multi button function.
- When running the hoist downward and parameter P03 with interlock is used the hoist will stop going down when the internal system pressure is below P03 by 2 units – this is to prevent the gripper tool to fall over the load when unloading the load.

WIRING OF CONTROLLER PCB REV 21

Power supply contact P1

#	Label	Data	Comment
1	-	24 VDC	24VDC min 2A
2	-	24 VDC	Current consumption: ca 200 mA + gripdon

Contact P2

#	Label	Data	Comment
1	OUT1	1A OC	Evacuation valve, moves lift down slow - ”low flow”
2	OUT2	1A OC	Air supply valve, moves lift up slow - ”low flow”
3	OUT3	1A OC	Air supply valve, moves lift up fast - ”high flow”
4	OUT4	1A OC	LED, indicates grip allowed/not allowed
5	+24V		Power supply to the valves
6	+24V		Power supply to the valves
7	GND		
8	TXD		RS 232

9	RXD		RS 232
10	GNB		Ext computer GND

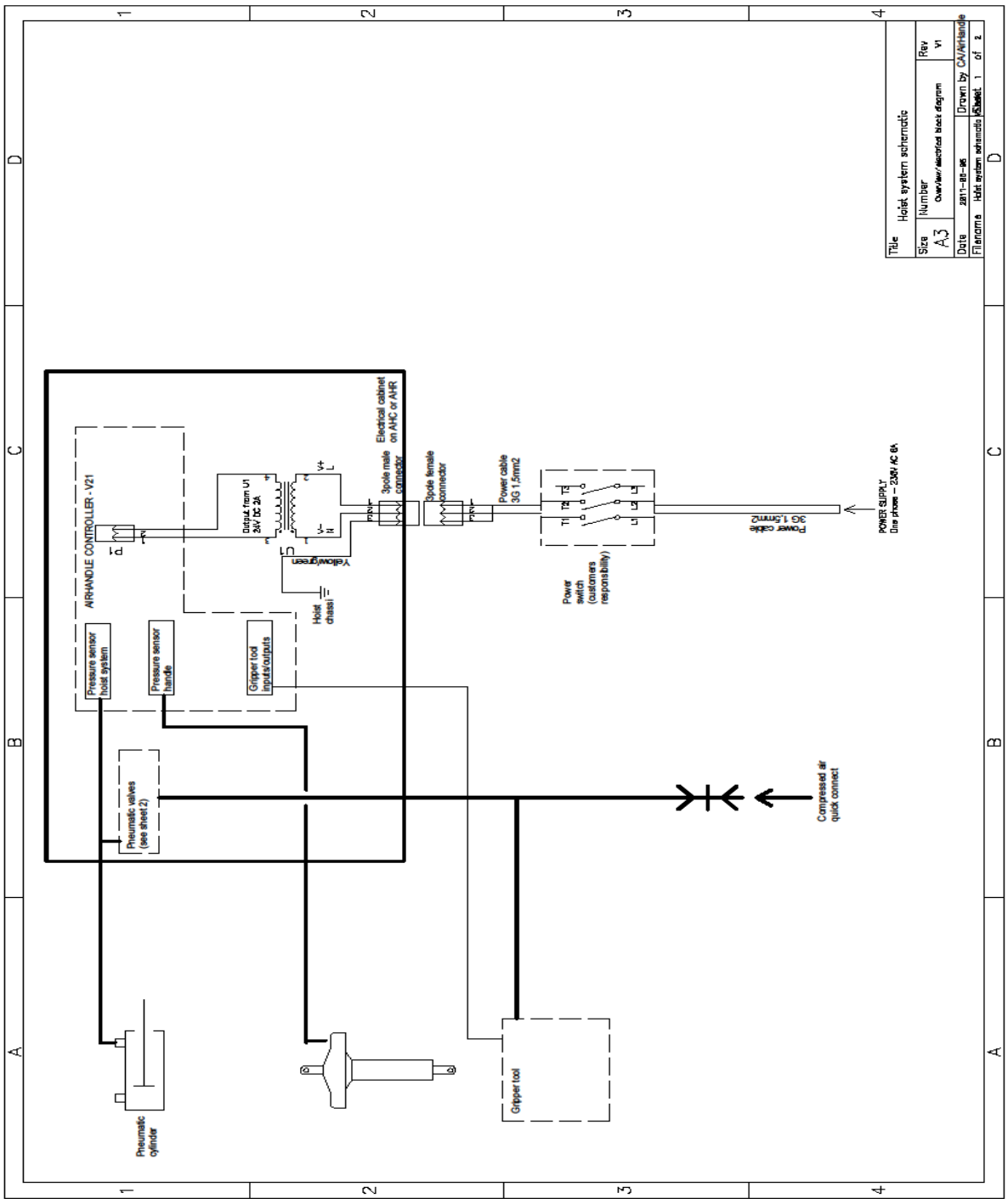
Contact P3

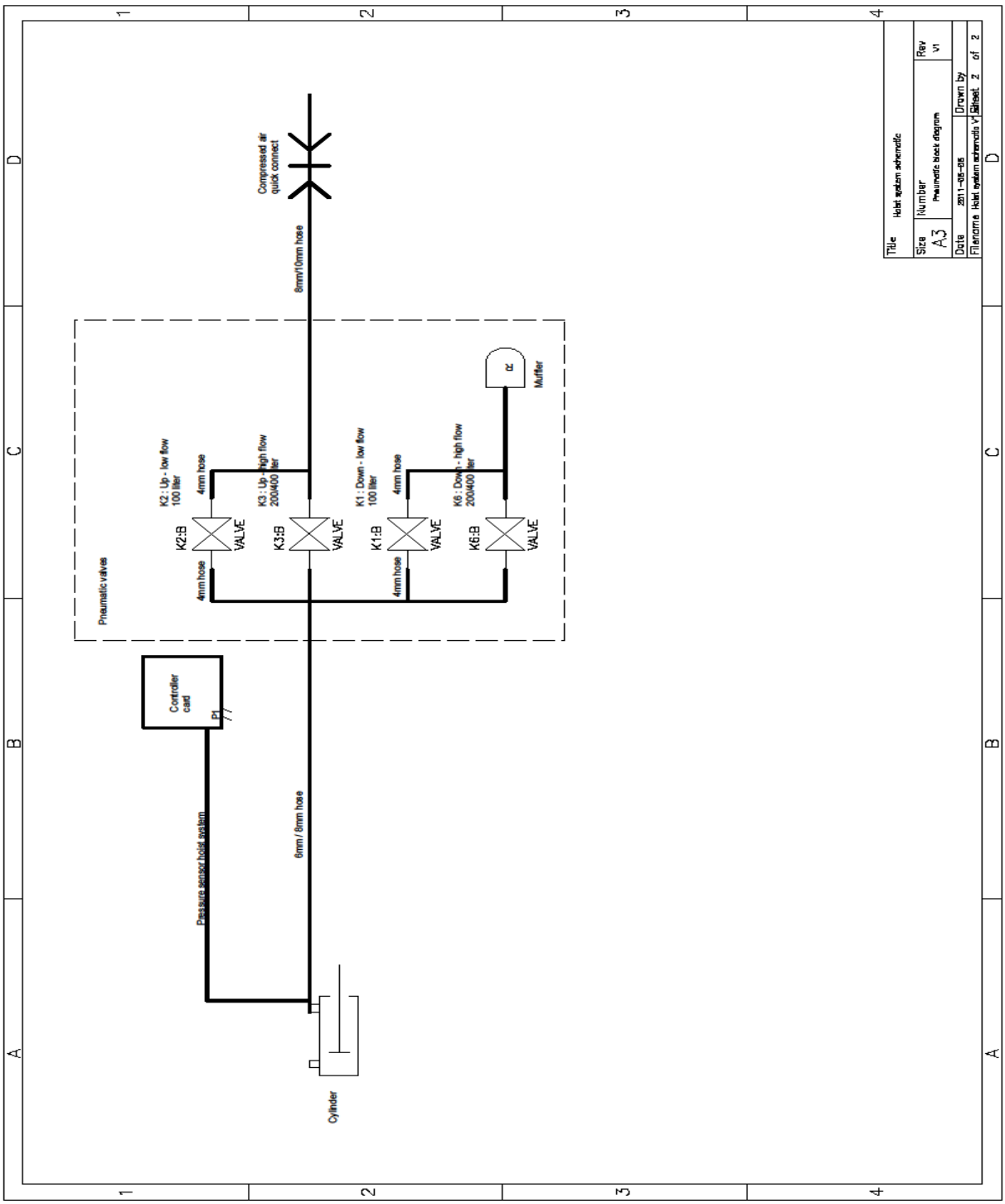
#	Label	Data	Comment
1	IN1	36Vmax	Grip control input – grip/release button from gripper tool
2	IN2	36Vmax	Future expansion
3	IN3	36Vmax	GripOk – e.g. vacuum indication (stop up)
4	IN4	36Vmax	Future expansion
5	OUT5	1A OC	GripRelease valve output
6	OUT6	1A OC	GripActivate valve output
7	OUT7	1A OC	Evacuation valve, moves lift down fast - ”high flow”
8	OUT8	1A OC	Brake output
9	+24V		Supply to gripper tool (1A autofuse total)
10	+24V		Supply to gripper tool (1A autofuse total)

NOTE!

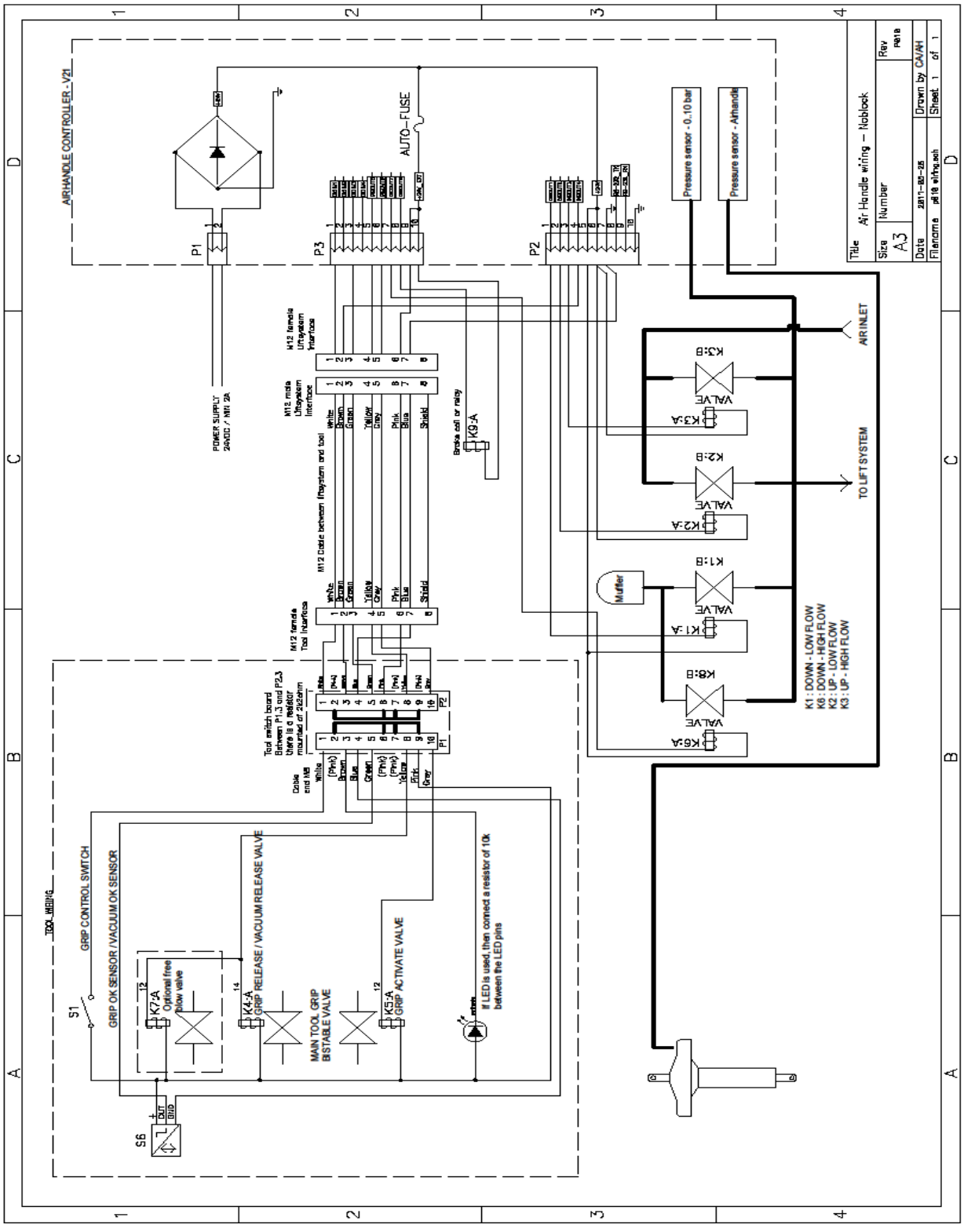
OC = ”Open collector” – i.e. load must be connected between +24V and OUTn.

Block diagram



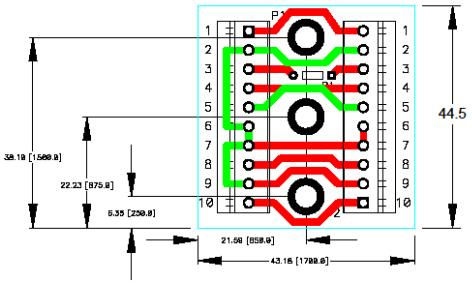

Compressed air quick connect
8mm/10mm hose
Pneumatic valves
K2 : Up - low flow 100 liter
4mm hose
K3 : Up - high flow 200/400 liter
K1 : Down - low flow 100 liter
4mm hose
K6 : Down - high flow 200/400 liter
K2:B VALVE
K3:B VALVE
K1:B VALVE
K6:B VALVE
4mm hose
4mm hose
Muffler
Controller card
P1
Pressure sensor hold system
6mm / 8mm hose
Cylinder
Title Hoist system schematic
Size A3
Number Pneumatic block diagram
Rev v1
Date 2011-05-05
Drawn by
Filename Hoist system schematic v1
Sheet 2 of 2

Wiring diagram



Tool interface (optional item)

Tool interface is a card that is placed in the gripper tool. On one side you connect the gripper tool functions i.e. grip/realease valve, freeblow valve, grip ok sensors etc. the other side is connected to the media spiral coming from the hoist. The card has a resistor for the LED function, if you use a LED with integrated resistor then you may have to remove the resistor on the tool interface and solder a junction where the resistor should be.



#	Corresponds to contacts P2 and P3 of controller card
1	IN1 – P3.1 Grip control input – grip/releas button from gripper
2	+24V – P3.9
3	OUT4 – P2.4 LED, indicates grip allowed/not allowed
4	GND – P2.7
5	IN3 – P3.3 GripOk – e.g. vacuum indication (stop up)
6	+24V – P3.9
7	+24V – P3.9
8	OUT5 – P3.5 GripRelease valve output
9	+24V – P3.9
10	OUT6 – P3.6 GripActivate valve output

SETTINGS FOR DIFFERENT GRIPPER TOOL FUNCTIONS

Features and ”Hidden” functions

- When power up the system pressure is checked to control if pressure is over P03 (if set to otherwise than 0), if the pressureis greater than set value the controller card will “press grip activation” by itself in a try to secure assumed load. The controller card will adapt to the proper sequence depending of which button mode that is used i.e. toggle or multi-button function.
- When driving downward and P03 is used the hoist will stop downward when the pressure is below P03 by 2 units – this will prevent the gripper tool to fall at its side when driving down and lands the load against a surface.
- LED (option) that indicates the interlock limit works as follows…
  when the hoist is not balanced the LED is lit when the pressure is below the interlock limit (**P03**), when pressure is over **P03** the LED is out.
  If the hoist switch to balance mode the LED starts to blink, no matter if pressure is below or over **P03**. If pressure is below **P03** the LED will blink with 2Hz and over P03 blink with 1Hz (2Hz is more lit than 1Hz thus corresponding to unbalanced mode)

Air Handle Basic

Setting parameters when only Basic functionality is used.

A FIRST CHECK OF HOIST AND HANDLE

1. Check that compressed air and power supply is connected to the equipment.

2. Check that the media spiral is properly connected to the maneouvre handle.

3. Make sure the gripper tool is securely connected in the junction point to the hoist.

SETTING OF CONTROLLER PARAMETERS

With the menu buttons marked Menu+ and Menu- you scroll up and down in the controler's status- and parameterregister – the register numbers are in the first two digits of the display. With the (+) and (-) buttons you can change the parameters value – this is the two last digits in the display.

Note that the status registers can not be changed, these are to display values of interest. Start by scrolling to parameter:

P11 (SupplyPressure) Adjust this to match the compressed air supply the hoist is connected to. If you do not know the pressure – set the value to 99 which correspond to 9,9 Bar.

P01 (DeadBand) Set the "deadband" for the handle. A high value makes the handle less sensitive – more force is needed to get an up/down signal. Default value 10.

P03 (ReleaseOk) Set to 00 (if grip/release function is used and P03 is set to 00 the load can be release unconditionly), if not set to 00 and the system pressure is over this value the hoist will assume that there is an object in the grippper and the controller card will activate the grip valve by itself and by default the GripOk is valid thus stopping the upmovement.

P08 (MaxPressure) Set on 60 to initially, corresponds to 6,0 Bar. This value will be adjusted further down.

P06 (GripOk) Set to 00, otherwise the hoist will not go upward.

P09 (HandleInvert) Set normaly to 00 or 01 when the handle is mounted with the membrane downward. Is the handle mounted upside down with the membran upwards this setting should be 02 or 03.

P10 (Resonance) Set normaly to 00

P02 (Balancing) Set to 00 if you do not want balancing. Set to 30 or more for automatic balancing.

ADJUSTMENT FOR MAXIMUM LOAD

If the gripper tool is dimensioned for a certain maximum load or if you for any other reason want to maximize the lifting force – follow these steps:

1. Load the gripper tool with the object that is supposed to be handled. Run the hoist upwards a bit until gripper and load is hanging in the air.

2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 43), the display's two last digits.

3. Scroll to parameter **P08** (Maxpressure) and adjust the value to the value you read at paragraph two

and add one or two units (e.g. 45)

4. Check that the load limit works by running the hoist with maximum load up and down – this should run smooth with no stops when running upward. Run the load with the handle slowly up and at the same time add more load e.g. by pressing the load down with you free hand – this extra pressure will now stop the up motion. The setting should be a little more than the actual maximum load.

AirHandle Base do not use remaining parameters.

Air Handle 3/2-valve

Setting parameters when the handle is used with a 3/2 valve.

Used with vacuum tool with ejector and suction cups or other single acting components e.g. bottle grippers, pneumatic fingers, spring return cylinders. 24VDC sensors for "Grip OK" can be connected.

A FIRST CHECK OF HOIST AND HANDLE

1. Check that compressed air and power supply is connected to the equipment.

2. Check that the media spiral is properly connected to the maneouvre handle.

3. Make sure the gripper tool is securely connected in the junction point to the hoist. Is sensor for ”GripOK” used this sensor must now be connected.

SETTING OF CONTROLLER PARAMETERS

With the menu buttons marked Menu+ and Menu- you scroll up and down in the controler’s status- and parameterregister – the register numbers are in the first two digits of the display. With the (+) and (-) buttons you can change the parameters value – this is the two last digits in the display.

Note that the status registers can not be changed, these are to display values of interest. Start by scrolling to parameter:

P11 (SupplyPressure) Adjust this to match the compressed air supply the hoist is connected to. If you do not know the pressure – set the value to 99 which correspond to 9,9 Bar.

P01 (DeadBand) Set the ”deadband” for the handle. A high value makes the handle less sensitive – more force is needed to get an up/down signal. Default value 10.

P05 (ReleasePulse) Pulse length for release signal (Release). Default value of 10 which correspond to 0,5sec see paramter table for more information.

P04 (GripPulse) Pulse length for grip signal (Grip). Default value of 10 which correspond to 0,5sec see paramter table for more information.

P08 (MaxPressure) Set on 60 to initially, corresponds to 6,0 Bar. This value will be adjusted further down.

P06 (GripOk) Set to 00, otherwise the hoist will not go upward.

P09 (HandleInvert) Set normaly to 00 or 01 when the handle is mounted with the membrane downward. Is the handle mounted upside down with the membran upwards this setting should be 02 or 03.

P10 (Resonance) Set normaly to 00

P02 (Balancing) Set to 00 if you do not want balancing. Set to 30 or more for automatic balancing.

P03 (ReleaseOk) Set initially to 00 – this will be adjusted later. NOTE! The load can now be released while being evelated.

P07 (ButtonFunction) Set to 00

ADJUSTMENT FOR MAXIMUM LOAD

If the gripper tool is dimensioned for a certain maximum load or if you for any other reason want to maximize the lifting force – follow these steps:

1. Load the gripper tool with the object that is supposed to be handled. Run the hoist upwards a bit until gripper and load is hanging in the air.

2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 43), the display’s two last digits.

3. Scroll to parameter **P08** (Maxpressure) and adjust the value to the value you read at paragraph two plus add one or two units (e.g. 45)

4. Check that the load limit works by running the hoist with maximum load up and down – this should run smooth with no stops when running upward. Run the load with the handle slowly up and at the same time add more load e.g. by pressing the load down with you free hand – this extra pressure will now stop the up motion. The setting should be a little more than the actual maximum load.

SETTING TO INTERLOCK RELEASE SIGNAL

We will now adjust the pressure level where the load can not be released (weights more than gripper tool):

1. Setting must be done with only gripper tool – no load. Run gripper tool up, leave elevated in air.
2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 06), the display's two last digits.
3. Scroll to parameter **P03** (ReleaseOk) and adjust the value to the value you read at paragraph two and add one or two units (e.g. 08).
4. Check that the interlock works by picking a load up in the gripper tool. When the wire is tensed and the goods start to lift up the LED indicator will go out - the Grip/Release button do not work. The Grip/Release button will not work until the hoist is unloaded i.e. the pressure is below **P03**.

Air Handle 5/2-valve

Setting parameters when the handle is used with a 5/2 valve.

Used with pinch and gripper tool with double acting cylinders. 24VDC sensors for "Grip OK" can be connected.

A FIRST CHECK OF HOIST AND HANDLE

1. Check that compressed air and power supply is connected to the equipment.
2. Check that the media spiral is properly connected to the maneouvre handle.
3. Make sure the gripper tool is securely connected in the junction point to the hoist. Is sensor for "GripOK" used this sensor must now be connected.

SETTING OF CONTROLLER PARAMETERS

With the menu buttons marked Menu+ and Menu- you scroll up and down in the controler's status- and parameterregister – the register numbers are in the first two digits of the display. With the (+) and (-) buttons you can change the parameters value – this is the two last digits in the display.

Note that the status registers can not be changed, these are to display values of interest. Start by scrolling to parameter:

P11 (SupplyPressure) Adjust this to match the compressed air supply the hoist is connected to. If you do not know the pressure – set the value to 99 which correspond to 9,9 Bar.

P01 (DeadBand) Set the ”deadband” for the handle. A high value makes the handle less sensitive – more force is needed to get an up/down signal. Default value 10.

P05 (ReleasePulse) Pulse length for release signal (Release). Default value of 10 which correspond to 0,5sec see paramter table for more information.

P04 (GripPulse) Pulse length for grip signal (Grip). Default value of 10 which correspond to 0,5sec see paramter table for more information.

P08 (MaxPressure) Set on 60 to initially, corresponds to 6,0 Bar. This value will be adjusted further down.

P06 (GripOk) Setting depends of what type of sensor is used. Is the signal active high (NC 24V) the setting shall be 01 and if signal is active low (NO 0V) or if “GripOK” is not used the setting shall be 00.

P09 (HandleInvert) Set normaly to 00 or 01 when the handle is mounted with the membrane downward. Is the handle mounted upside down with the membran upwards this setting should be 02 or 03.

P10 (Resonance) Set normaly to 00

P02 (Balancing) Set to 00 if you do not want balancing. Set to 30 or more for automatic balancing.

P03 (ReleaseOk) Set initially to 00 – this will be adjusted later. NOTE! The load can now be released while being evelated.

P11 Ställ till 00

ADJUSTMENT FOR MAXIMUM LOAD

If the gripper tool is dimensioned for a certain maximum load or if you for any other reason want to maximize the lifting force – follow these steps:

1. Load the gripper tool with the object that is supposed to be handled. Run the hoist upwards a bit until gripper and load is hanging in the air.

2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 43), the display’s two last digits.

3. Scroll to parameter **P08** (Maxpressure) and adjust the value to the value you read at paragraph two plus add one or two units (e.g. 45)

4. Check that the load limit works by running the hoist with maximum load up and down – this should

run smooth with no stops when running upward. Run the load with the handle slowly up and at the same time add more load e.g. by pressing the load down with you free hand – this extra pressure will now stop the up motion. The setting should be a little more than the actual maximum load.

SETTING TO INTERLOCK RELEASE SIGNAL

We will now adjust the pressure level where the load can not be released (weights more than gripper tool):

1. Setting must be done with only gripper tool – no load. Run gripper tool up, leave elevated in air.

2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 06), the display's two last digits.

3. Scroll to parameter **P03** (ReleaseOk) and adjust the value to the value you read at paragraph two and add one or two units (e.g. 08).

4. Check that the interlock works by picking a load up in the gripper tool. When the wire is tensed and the goods start to lift up the LED indicator will go out - the Grip/Release button do not work. The Grip/Release button will not work until the hoist is unloaded i.e. the pressure is below **P03**.

Air Handle 3/2-free blow

Setting parameters when the handle is used with a 3/2 valve and a freeblow valve is used as well.

Used with vacuum tool with ejector and suction cups. Can be used when the ejector has built in non-return valve or when a free blow of filter is desired. 24VDC sensors for "Grip OK" can be connected.

A FIRST CHECK OF HOIST AND HANDLE

1. Check that compressed air and power supply is connected to the equipment.

2. Check that the media spiral is properly connected to the maneouvre handle.

3. Make sure the gripper tool is securely connected in the junction point to the hoist. Is sensor for "GripOK" used this sensor must now be connected.

SETTING OF CONTROLLER PARAMETERS

With the menu buttons marked Menu+ and Menu- you scroll up and down in the controler's status- and parameterregister – the register numbers are in the first two digits of the display. With the (+) and (-) buttons you can change the parameters value – this is the two last digits in the display.

Note that the status registers can not be changed, these are to display values of interest. Start by scrolling to parameter:

P11 (SupplyPressure) Adjust this to match the compressed air supply the hoist is connected to. If you do not know the pressure – set the value to 99 which correspond to 9,9 Bar.

P01 (DeadBand) Set the "deadband" for the handle. A high value makes the handle less sensitive – more force is needed to get an up/down signal. Default value 10.

P05 (ReleasePulse) Pulse length for release signal (Release). Default value of 10 which correspond to 0,5sec see paramter table for more information.

P04 (GripPulse) Pulse length for grip signal (Grip). Default value of 10 which correspond to 0,5sec see paramter table for more information.

P08 (MaxPressure) Set on 60 to initially, corresponds to 6,0 Bar. This value will be adjusted further down.

P06 (GripOk) Set to 00, otherwise the hoist will not go upward.

P09 (HandleInvert) Set normaly to 00 or 01 when the handle is mounted with the membrane downward. Is the handle mounted upside down with the membran upwards this setting should be 02 or 03.

P10 (Resonance) Set normaly to 00

P02 (Balancing) Set to 00 if you do not want balancing. Set to 30 or more for automatic balancing.

P03 (ReleaseOk) Set initially to 00 – this will be adjusted later. NOTE! The load can now be released while being evelated.

P07 (ButtonFunction) Set to 00 for regular button function grip/relase (toggle). Set to 01 for a 3-way function (blow)floatmode/grip/release.

ADJUSTMENT FOR MAXIMUM LOAD

If the gripper tool is dimensioned for a certain maximum load or if you for any other reason want to maximize the lifting force – follow these steps:

1. Load the gripper tool with the object that is supposed to be handled. Run the hoist upwards a bit until gripper and load is hanging in the air.

2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 43), the display's two last digits.

3. Scroll to parameter **P08** (Maxpressure) and adjust the value to the value you read at paragraph two plus add one or two units (e.g. 45)

4. Check that the load limit works by running the hoist with maximum load up and down – this should run smooth with no stops when running upward. Run the load with the handle slowly up and at the same time add more load e.g. by pressing the load down with you free hand – this extra pressure will now stop the up motion. The setting should be a little more than the actual maximum load.

SETTING TO INTERLOCK RELEASE SIGNAL

We will now adjust the pressure level where the load can not be released (weights more than gripper tool):

1. Setting must be done with only gripper tool – no load. Run gripper tool up, leave elevated in air.

2. Check the value for status register **S01**(Liftpressure). Note the register value (e.g. 06), the display's two last digits.

3. Scroll to parameter **P03** (ReleaseOk) and adjust the value to the value you read at paragraph two and add one or two units (e.g. 08).

4. Check that the interlock works by picking a load up in the gripper tool. When the wire is tensed and the goods start to lift up the LED indicator will go out - the Grip/Release button do not work. The Grip/Release button will not work until the hoist is unloaded i.e. the pressure is below **P03**.