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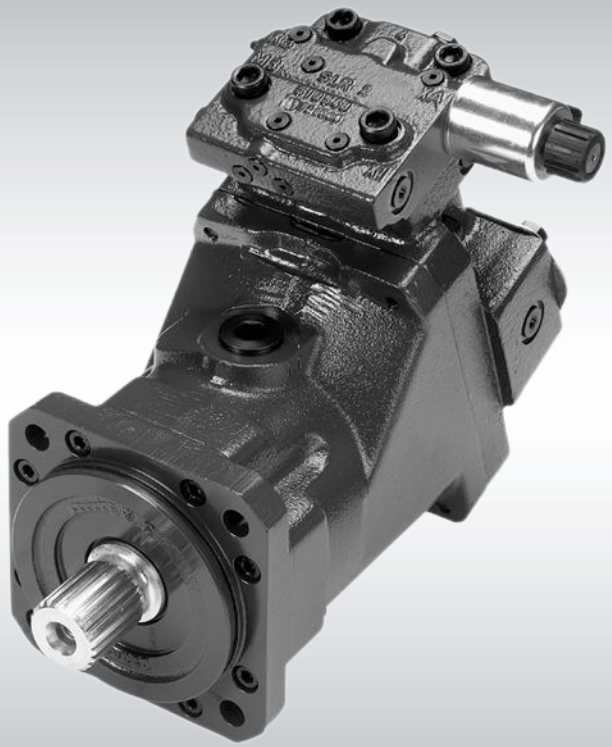
Electrical Installation

Series 51-1 Motor

Hydraulic Two-Position Controls TH



Revision history

Table of revisions

Date	Changed	Rev
August 2015	Converted to Danfoss layout	BA
April 2007	First edition	AA

Contents

Literature references

S51-1 Hydraultic Two-Position Controls TH literature references

Literature title	Description	Literature number
S51 and 51-1 Bent Axis Variable Displacement Motors Technical Information	Complete product electrical and mechanical specifications	520L0440
On/Off Functions Function Block User Manual	Compliant function block set-up information	11022918

Latest version of technical literature

Danfoss product literature is online at: *http://powersolutions.danfoss.com/literature/*

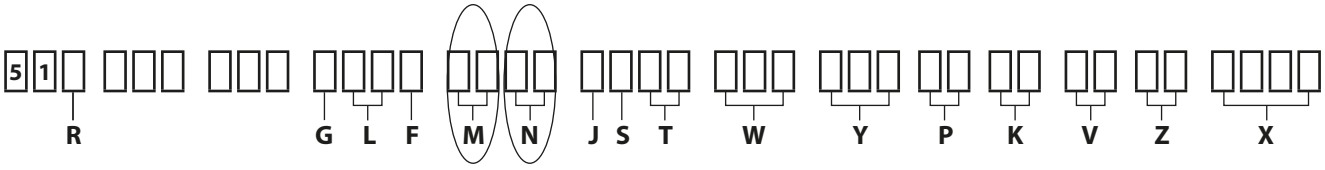
Product overview

Product image

S51-1 Hydraulic Two-Position Controls TH

Nomenclature

S51-1 model code



Code M and N options

M	Description	N	Description
TH	Hydraulic two-position control	D1	Electric brake pressure defeat, 12 Vdc, DIN Connector
		D2	Electric brake pressure defeat, 24 V,dc DIN Connector
		D7	Electric brake pressure defeat, 12 Vdc, AMP Connector
		CA	With hydraulic brake pressure defeat
		C2	Without brake pressure defeat

Only certain control options for the S51-1 motor utilize the Hydraulic Two-Position Control. The combination of the M and N modules define the motor control's functionality. Please refer to the motor's nomenclature to determine if the motor is equipped with the proper option. The nomenclature can be found on the motor's nametag.

Product overview

Theory of operation

TH**

Displacement can be changed hydraulically under load from minimum displacement to maximum displacement and vice versa. Pressure on port X1 must be equal to the pressure of the motor case ± 0.2 bar, [3.0 psi] this keeps the motor at minimum displacement. Pressure 10 bar, [145 psi] to 35 bar, [510 psi] above case pressure on port X1 strokes the motor to maximum displacement.

PCOR

The control can be overridden by Pressure Compensator Override (PCOR) using high loop pressure. When the PCOR activates, the motor displacement increases toward maximum. Pressure ramp from PCOR start pressure (with motor at minimum displacement) until maximum displacement is reached is less than 10 bar [145 psi]. This ensures optimal power utilization throughout the entire displacement range of the motor. PCOR start pressure is adjustable from 110 to 370 bar [1600 to 5370 psi].

THCA

Pressure compensator configuration: THCA with hydraulic brake pressure defeat.

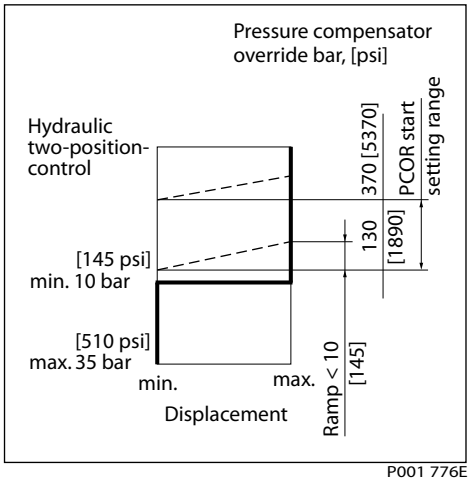
A shuttle valve ahead of the pressure compensator prevents operation in the deceleration direction (when motor is running in pump mode). This is designed to prevent rapid or uncontrolled deceleration while the vehicle/machine is slowing down. The shuttle valve must be controlled by a 2-line external signal. Pressure compensator override with brake pressure defeat is mainly used in systems with pumps having electric or hydraulic proportional controls or automotive controls.

THD1, THD2, THD7

Pressure compensator configuration: THD1, THD2, THD7 with electric brake pressure defeat.

A solenoid-switched valve ahead of the pressure compensator prevents operation in the deceleration direction (when motor is running in pump mode). This is designed to prevent rapid or uncontrolled deceleration while the vehicle/machine is slowing down. The solenoid valve must be controlled by an external electric signal.

Control operation TH**



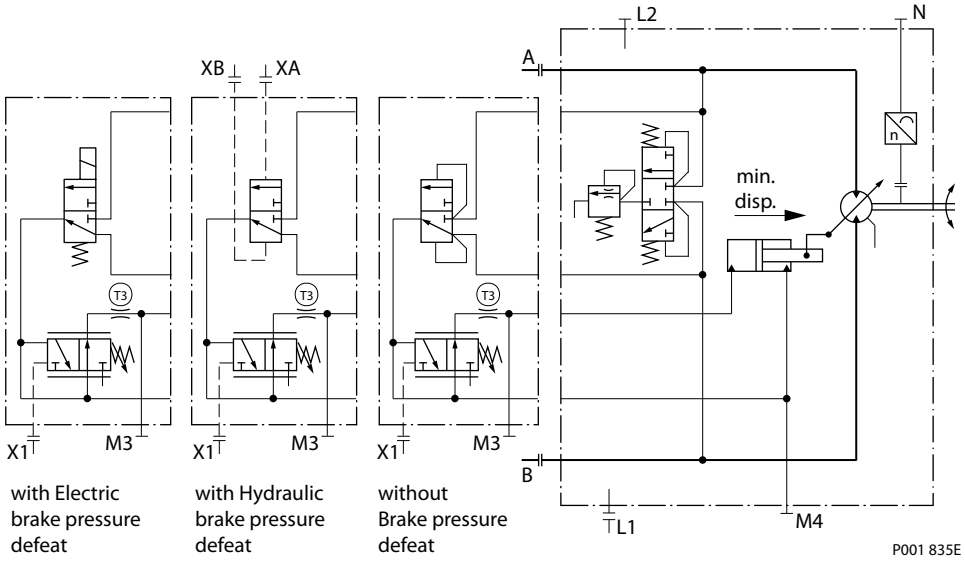
Product overview

Warning

Unintended vehicle or machine movement hazard. The loss of hydrostatic drive line power, in any mode of operation (forward, neutral, or reverse) may cause the system to lose hydrostatic braking capacity. You must provide a braking system, redundant to the hydrostatic transmission, sufficient to stop and hold the vehicle or machine in the event of hydrostatic drive power loss.

Hydraulic schematics

*Circuit diagram – motor with two-position control TH***



with Electric brake pressure defeat

with Hydraulic brake pressure defeat

without Brake pressure defeat

Ports:

A, B = Main pressure lines
L1, L2 = Drain lines
M1, M2 = Gauge port for A and B
M3, M4 = Gauge port servo pressure
M5 (X3) = Gauge port servo supply
XA, XB = Control pressure ports, brake pressure defeat
X1 = Hydraulic two-position signal
X4 = Gauge port pressure compensator
T1, T2, T3, T7, T8 = Optional orifices
N = Speed sensor

Electrical specifications

Electric brake pressure defeat solenoid

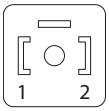
N-option	D1, D7	D2
Voltage	12 Vdc	24 Vdc
Rated power	34 W	34 W

Electrical installation

Pinout

DIN 43650 connector

Pin location



Pinout

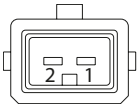
Pin	Function
1	PWM signal
2	Ground

Pinout (alternative)

Pin	Function
1	Ground
2	PWM signal

AMP Junior Power Timer connector

Pin location



Pinout

Pin	Function
1	PWM signal
2	Ground

Pinout (alternative)

Pin	Function
1	Ground
2	PWM signal

Pin compatibility

PLUS+1® module pin type

Pin	Function
1,2	DOUT
1,2	DOUT/PVG Power
1,2	PWMOUT/DOUT/PVG Power supply
1,2	PWMOUT/DOUT/PVGOUT
1,2	Power ground -

Electrical installation

Pressure compensator logic

Hydraulic brake pressure defeat

Motor rotation	High pressure port	Control pressure on port*	PCOR function
CW	A	XA	yes
CW	A	XB	no
CCW	B	XA	no
CCW	B	XB	yes

* Differencial control pressure between port XA/XB:
Δp_{min} = 0.5 bar [7 psi]
Δp_{max} = 50 bar [725 psi]

Electric brake pressure defeat

Motor rotation	High pressure port	Solenoid	PCOR function
CW	A	energized	yes
CW	A	non energized	no
CCW	B	energized	no
CCW	B	non energized	yes

Mating connector

DIN 43650 connector parts list

Description	Quantity	Ordering Number
DIN 43650 connector	1	Hirschmann 932 106-100
Mating connector kit	1	Danfoss K09129

AMP connector parts list

Description	Quantity	Ordering number
Two pin connector	1	Tyco Electronics 282189-1
Contacts	2	Tyco Electronics 929940-1
Seal plugs	2	Tyco Electronics 828904-1
Mating connector kit	1	Danfoss K19815

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