



Electrical Installation  
Series 90 Pump  
**3-Position (FNR) Electric Control**



**Revision history***Table of revisions*

| <b>Date</b> | <b>Changed</b>              | <b>Rev</b> |
|-------------|-----------------------------|------------|
| August 2015 | Converted to Danfoss layout | BA         |
| April 2007  | First edition               | AA         |

**Contents****Literature references**

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**Electrical installation**

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**Electrical Installation      S90 3-Position (FNR) Electric Control**

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**Literature references****S90 Pump 3-Position (FNR) Electric Control literature references**

| <b>Literature title</b>   | <b>Description</b>  | <b>Literature number</b> |
|---|---|--------------------------|
| <i>S90 Axial Pumps Technical Information</i>                        | Complete product electrical and mechanical specifications | 520L0603                 |
| <i>PLUS+1® Compliant S90 FNR Control Function Block User Manual</i> | Compliant function block set-up information               | 11022881                 |

**Latest version of technical literature**

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

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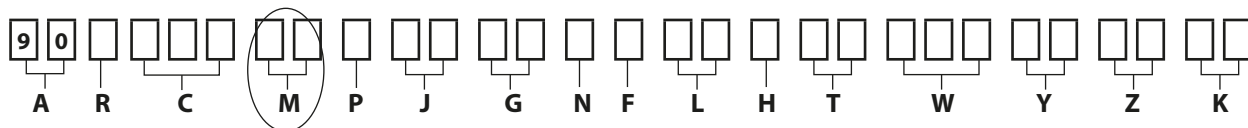
**Product overview**

**Product image**

*S90 Pump 3-Position (FNR) Electric Control*



**Nomenclature**



*M module - FNR control options*

| Option | Description                               |
|--------|---|
| DC     | 3-position (FNR) Electric Control, 12 Vdc |
| DD     | 3-position (FNR) Electric Control, 24 Vdc |

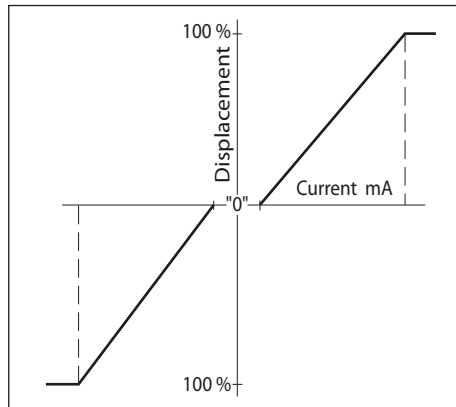
Only certain control options for the Series 90 pump utilize the 3-position (FNR) Electric Control. Please refer to the pump's nomenclature to determine if the pump is equipped with the proper option. The nomenclature can be found on the pump's nametag.

**Product overview**

**Theory of operation**

The 3-position (FNR) Electric Control uses an electric input signal to switch the pump to a full stroke position.

**Pump displacement versus electrical signal**



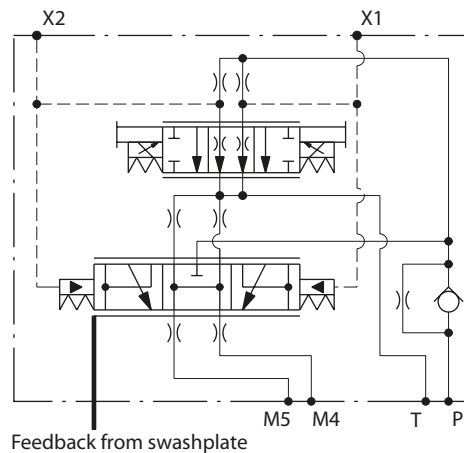
**Hydrostatic drive line power**

**⚠ 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**

*3-position electric control*



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**Electrical Installation      S90 3-Position (FNR) Electric Control**

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**Product overview****Electrical specifications**

*S90 3-Position (FNR) electrical specifications*

|                    |            |            |
|--------------------|------------|------------|
| <b>Voltage</b>     | <b>12V</b> | <b>24V</b> |
| <b>Rated power</b> | 33 W       | 33 W       |

## Electrical Installation S90 3-Position (FNR) Electric Control

### 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 |

#### 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                 |

#### Warning

Unintended vehicle or machine movement hazard. Verify the wiring harness to ensure the correct PLUS +1° pin is properly connected to each control pin.

#### S90 3-position FNR input/output matrix

| Input shaft rotation | Clockwise |     | Counterclockwise |     |
|----------------------|-----------|-----|------------------|-----|
|                      | A         | B   | A                | B   |
| Signal at solenoid   | A         | B   | A                | B   |
| Port A flow          | Out       | In  | In               | Out |
| Port B flow          | In        | Out | Out              | In  |
| Servo cylinder       | M5        | M4  | M5               | M4  |



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**Electrical Installation      S90 3-Position (FNR) Electric Control**

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Electrical installation

**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         |







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