



User Manual

# Orbital Motors with Speed Sensor OMM / P / R / S EM, EMSW EM and OMT / V EM



**Revision History***Table of Revisions*

<b>Date</b>	<b>Changed</b>	<b>Rev</b>
Mar 2014	Converted to Danfoss layout - DITA CMS	BA
Sep 2010	First edition	AC

**Contents****Safety precautions**

Safety precautions.....	4
Unintended machine movement.....	4
Flammable cleaning solvents.....	4
Fluid under pressure.....	4
Personal safety.....	4

**Motor with speed sensor**

LSHT motor with spool valve.....	5
LSHT motor with disc valve.....	5
Testing.....	5
Measuring - duty cycles.....	5
Measuring - revolutions per minute.....	6

**Instructions 520L0263 - PNP sensor**

Instructions 520L0263 - PNP Sensor.....	8
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**Instructions 520L0782 - NPN sensor**

Instructions 520L0782 - NPN sensor.....	10
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**Safety precautions****Safety precautions**

Always consider safety precautions before beginning a service procedure. Protect yourself and others from injury. Take the following general precautions whenever servicing a hydraulic system.

***Unintended machine movement***** Warning**

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Unintended movement of the machine or mechanism may cause injury to the technician or bystanders. To prevent unintended movement, secure the machine or disable / disconnect the mechanism while servicing.

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***Flammable cleaning solvents***** Warning**

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Some cleaning solvents are flammable. To eliminate the risk of fire, do not use cleaning solvents in an area where a source of ignition may be present.

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***Fluid under pressure***** Warning**

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Escaping hydraulic fluid under pressure can have sufficient force to penetrate your skin causing serious injury and/or infection. This fluid may also be hot enough to cause burns. Use caution when dealing with hydraulic fluid under pressure. Relieve pressure in the system before removing hoses, fittings, gauges, or components. Never use your hand or any other body part to check for leaks in a pressurized line. Seek medical attention immediately if you are cut by hydraulic fluid.

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***Personal safety***** Warning**

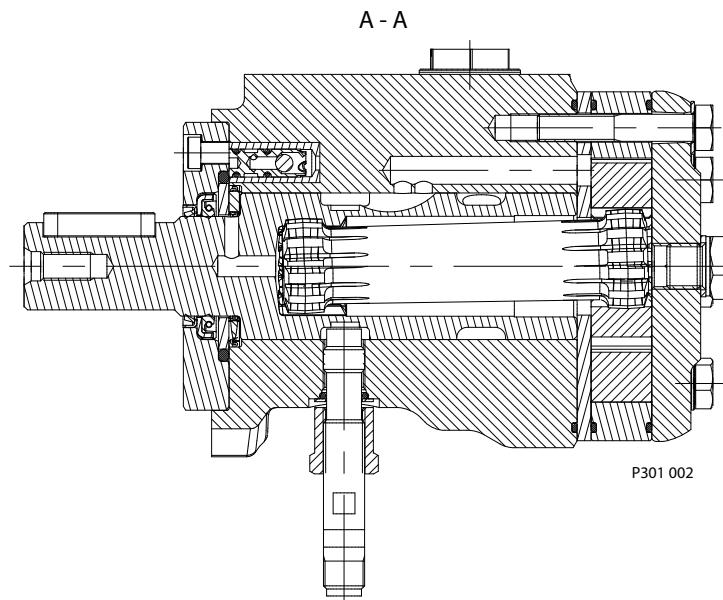
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Protect yourself from injury. Use proper safety equipment, including safety glasses, at all times.

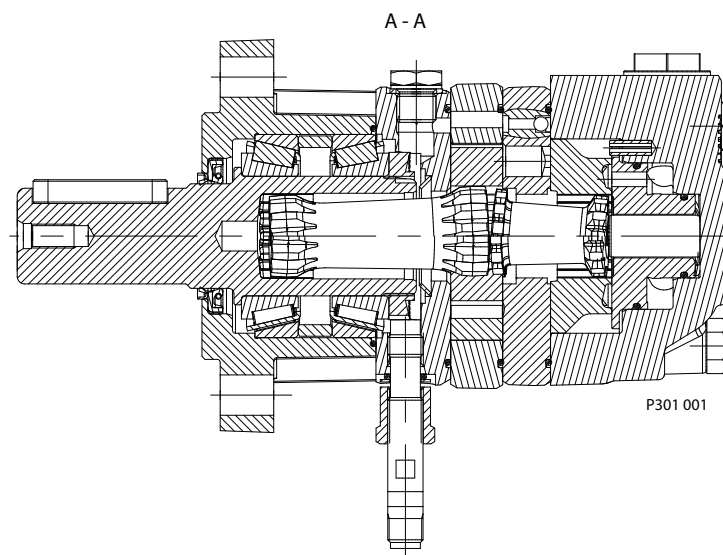
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Motor with speed sensor

LSHT motor with spool valve



LSHT motor with disc valve



## Testing

### *Measuring - duty cycles*

1. Mount the sensor in motor in accordance with **520L0263** or **520L0782** and place the the motor in the test panel.
2. Connect power supply and FLUKE-multi meter as described in the diagram
3. Set rotary switch of FLUKE-multimeter on V and activate Hz pushbutton twice (for % measuring).
4. With an oil flow to the motor sufficient to ensure even revolution with a warm motor. Measure the following duty cycles:

Motor with speed sensor

Motor type	Duty cycle, (%)
OMM EM	50 +/- 10
OMP EM	55 +/- 5
OMR EM	55 +/- 5
OMS/OMSW EM	55 +/- 5
OMT EM	55 +/- 5
OMV EM	55 +/- 5

**Measuring - revolutions per minute**

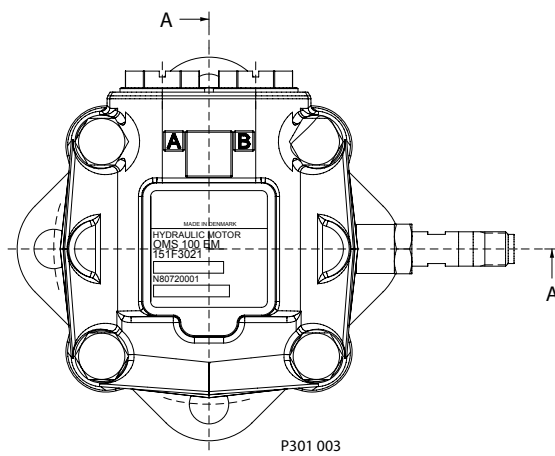
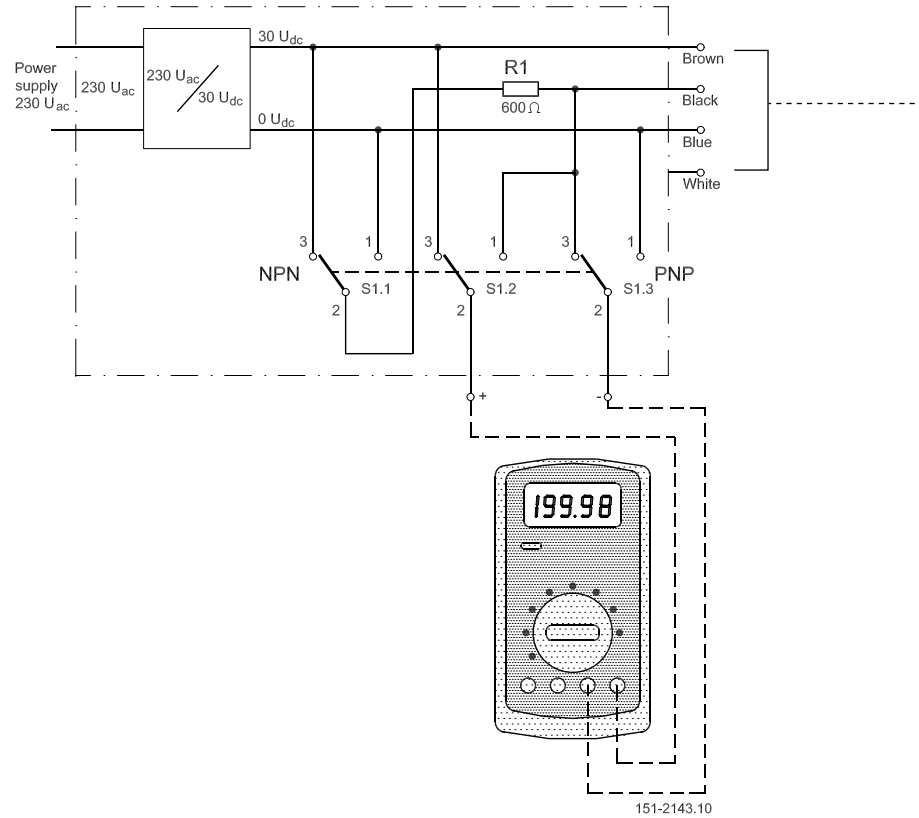
Measure also the frequency (Fr) with the multimeter and calculate the revolutions per minute and compare it with RPM-counter on the test panel

$$RPM = \frac{F_r \times 60}{PPR}$$

Resolution:

Pulses per rev.	OMM EM	OMP EM	OMR EM	OMS EM	OMSW EM	OMT EM	OMV EM
PPR	22	35	35	55	55	84	102

Motor with speed sensor



Instructions 520L0263 - PNP sensor

Instructions 520L0263 - PNP Sensor



Instructions

Motor with speed sensor OMM EM, OMP EM, OMR EM, OMS EM, OMSW EM, OMT EM, OMV EM

151R9945	<p>1</p>	<p>2</p>	151R9945
<p>3</p> <p>90°</p>	<p>3a</p>		
<p>4</p>	<p>5</p>		
<p>1. Fjern den monterede prop og skive på motoren (6 mm unbraco).</p> <p>1. Remove the plug and washer from the motor (6 mm Allen key).</p> <p>1. Den Stopfen und Scheibe aus dem Motor entfernen (6 mm Inbusschlüssel).</p> <p>1. Ôter le bouchon et la rondelle du moteur (clé Allen à 6 cannelures).</p> <p>2. Skru sensoren i, uden anvendelse af værktøj, til kontakt med motorens aksel / møtrik.</p> <p>2. Without tools screw in the sensor till it makes contact with the shaft/nut of the motor.</p> <p>2. Den Drehzahlgeber ohne Anwendung von Werkzeug einschrauben, bis Kontakt mit Welle/Mutter des Motors erreicht wird.</p> <p>2. Visser le capteur sans utiliser de l'outil jusqu'à ce qu'il y ait contact avec l'axe/l'écrou du moteur.</p> <p>3. Skru sensoren 1/4 omgang (90°) ud igen som vist på foto 3a.</p> <p>3. Turn 1/4 revolution back again (90°) as shown on photo 3a.</p> <p>3. Den Drehzahlgeber wieder 1/4 Umdrehung (90°) ausschrauben. Siehe Photo 3a.</p> <p>3. Dévisser le capteur d'un quart de tour (90°) comme indiqué sur la photo 3a.</p>		<p>4. Skru yderligere ud indtil de 2 gaffelflader (10 mm) er orienteret i samme retning som motorens længdeakse. Tolerance: ± 5°.</p> <p>4. Turn further back until the 10 mm flats of the sensor are aligned with th longitudinal axis of the motor. Tolerance ± 5°.</p> <p>4. Weiter so ausschrauben, bis die zwei Gabelflächen am Sensor identisch mit der Längsachse vom Motor orientiert sind. Toleranz ± 5°.</p> <p>4. Continuer à dévisser le capteur jusqu'à ce que les deux plats à fourche (10 mm) soient orientés dans la même direction que l'axe longitudinal du moteur. Tolérance : ± 5°</p> <p>5. Hold sensoren i denne position, medens omløber spændes med det foreskrevne tilspændingsmoment på 15 - 20 Nm.</p> <p>5. Keep the sensor in this position while tightening the compression nut to the prescribed torque of 15-20 Nm.</p> <p>5. Den Drehzahlgeber in dieser Stellung halten während die Überwurfmutter zum vorgeschriebenen Anzugsmoment von 15-20 Nm angezogen wird.</p> <p>5. Maintenir le capteur dans cette position et serrer l'écrou en appliquant le couple prescrit de 15 - 20 Nm.</p>	
<p>For at sikre sensorens funktionsevne, er det nødvendigt at trin 2 til 5 er udført korrekt og i den rigtige rækkefølge.</p> <p>To make the sensor work, be sure to carry out the steps 2 - 5 correctly and in the right order of succession.</p>		<p>Um die korrekte Funktion vom Drehzahlgeber zu sichern, müssen die Anweisungen 2 bis 5 genau und in der richtigen Reihenfolge beobachtet werden.</p> <p>Le bon fonctionnement du capteur est garanti par l'exécution correcte, et dans le bon ordre, des phases de montage 2 à 5.</p>	

Instructions 520L0263 - PNP sensor



**Tilslutning**  
**Connection**  
**Anschluß**  
**Raccordement**

**Advarsel: Drej ikke soklen**  
**Attention: Don't turn the socket**  
**Achtung: Den Sockel nicht drehen**  
**Attention: Ne pas tourner le socle**

Stik: Binder serie 713  
Connection: Binder series 713  
Stecker: Binder Serie 713  
Connecteur: Binder série 713

159G35.10

Stikben / Pin Stiftstecker / Point de fiche	Ledningsfarve / Conductor Leiterfarbe / Codes couleurs	Betegnelse / Designation Bezeichnung / Désignation	Specifikation / Specification Spécification / Spécification
1	Brun / Brown / Braun / Brun	Ud.c. Forsyning / supply Versorgung / Alimentation	11 - 30 V ===
2	Hvid / White / Weiß / Blanc	Forbindes ikke / Not connected Keine Verbindung / Non connecté	
3	Blå / Blue / Blau / Bleu	Ud.c. Forsyning / supply Versorgung / Alimentation	0 V ===
4	Sort / Black / Schwarz / Noir	Signal	Se nedenfor / See below Siehe unten / Voir ci-dessous

**Hastighedssignal**  
**Speed signal**  
**Drehzahlsignal**  
**Signal de vitesse**

159G33.10

Motortype / Motor type Motor Typ / Type de moteur	OMM EM	OMP EM	OMR EM	OMS EM	OMSW EM	OMT EM	OMV EM
Pulser pr. omdr. / Pulses per rev. Pulsen per Umdr. / Impulsions Par tour	22	35	35	55	55	84	102
Belastning / Load / Belastung / Charge	$I_{max} = 50 \text{ mA}$						

**Forbindelsesdiagram**  
**Connection diagram**  
**Anschlußschema**  
**Raccordement électrique**

159G34.10

Instructions 520L0782 - NPN sensor

Instructions 520L0782 - NPN sensor



**Instructions**

**Motor with speed sensor OMM EM, OMP EM, OMR EM, OMS EM, OMSW EM, OMT EM, OMV EM**

151R9904	<p>1</p>	<p>2</p>	151R9904
151R9904	<p>3</p> <p>90°</p>	<p>3a</p>	151R9904
151R9904	<p>4</p>	<p>5</p>	151R9904
<p>1. Fjern den monterede prop og skive på motoren (6 mm unbraco). 1. Remove the plug and washer from the motor (6 mm Allen key). 1. Den Stopfen und Scheibe aus dem Motor entfernen (6 mm Inbusschlüssel). 1. Ôter le bouchon et la rondelle du moteur (clé Allen à 6 cannelures).</p> <p>2. Skru sensoren i, uden anvendelse af værktøj, til kontakt med motorens aksel / møtrik. 2. Without tools screw in the sensor till it makes contact with the shaft/nut of the motor. 2. Den Drehzahlgeber ohne Anwendung von Werkzeug einschrauben, bis Kontakt mit Welle/Mutter des Motors erreicht wird. 2. Visser le capteur sans utiliser de l'outil jusqu'à ce qu'il y ait contact avec l'axe/l'écrou du moteur.</p> <p>3. Skru sensoren 1/4 omgang (90°) ud igen som vist på foto 3a. 3. Turn 1/4 revolution back again (90°) as shown on photo 3a. 3. Den Drehzahlgeber wieder 1/4 Umdrehung (90°) ausschrauben. Siehe Photo 3a. 3. Dévisser le capteur d'un quart de tour (90°) comme indiqué sur la photo 3a</p>		<p>4. Skru yderligere ud indtil de 2 gaffelflader (10 mm) er oriente-ret i samme retning som motorens længdeakse. Tolerance: ± 5° 4. Turn further back until the 10 mm flats of the sensor are aligned with th longitudinal axis of the motor. Tolerance ± 5°. 4. Weiter so ausschrauben, bis die zwei Gabelflächen am Sensor identisch mit der Längsachse vom Motor orientiert sind. Toleranz ± 5°. 4. Continuer à dévisser le capteur jusqu'à ce que les deux plats à fourche (10 mm) soient orientés dans la même direction que l'axe longitudinal du moteur. Tolérance : ± 5°</p> <p>5. Hold sensoren i denne position, medens omløber spændes med det foreskrevne tilspændingsmoment på 15 - 20 Nm. 5. Keep the sensor in this position while tightening the compression nut to the prescribed torque of 15-20 Nm. 5. Den Drehzahlgeber in dieser Stellung halten während die Überwurfmutter zum vorgeschriebenen Anzugsmoment von 15-20 Nm angezogen wird. 5. Maintenir le capteur dans cette position et serrer l'écrou en appliquant le couple prescrit de 15 - 20 Nm.</p>	
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Instructions 520L0782 - NPN sensor



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**Anschluß**  
**Raccordement**

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159G35.10

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4	Sort / Black / Schwarz / Noir	Signal	Se nedenfor / See below Siehe unten / Voir ci-dessous

**Hastighedssignal**  
**Speed signal**  
**Drehzahlssignal**  
**Signal de vitesse**

159G33.11

Motor type / Motor type Motor Typ / Type de moteur	OMM EM	OMP EM	OMR EM	OMS EM	OMSW EM	OMT EM	OMV EM
Pulser pr. omdr. / Pulses per rev. Pulsen per Umdr. / Impulsions Par tour	22	35	35	55	55	84	102
Belastning / Load / Belastung / Charge	$I_{max} = 50 \text{ mA}$						

**Forbindelsesdiagram**  
**Connection diagram**  
**Anschlußschema**  
**Raccordement électrique**

159G86.10



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Local address:

**Danfoss Power Solutions US Company**  
2800 East 13th Street  
Ames, IA 50010, USA  
Phone: +1 515 239 6000

**Danfoss Power Solutions GmbH & Co. OHG**  
Krokamp 35  
D-24539 Neumünster, Germany  
Phone: +49 4321 871 0

**Danfoss Power Solutions ApS**  
Nordborgvej 81  
DK-6430 Nordborg, Denmark  
Phone: +45 7488 2222

**Danfoss Power Solutions (Shanghai) Co. Ltd.**  
Building #22, No. 1000 Jin Hai Rd  
Jin Qiao, Pudong New District  
Shanghai, China 201206  
Phone: +86 21 3418 5200

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