



# Released Parts List

## Mechanics

For the foundry  
of the Volkswagen Group  
„technology specific part“

## 1 Change journal

Version	Date	Change	Page
1.8	01.01.2016	Mechanical specifications revised (Version 1.8) Adaption of the list of released parts for low flammable fluids. (HFC) will be handled separately.	all
1.8	04.02.2016	Exchange of the MAHLE logo and adaption of the document links because of the new MAHLE homepage <a href="http://www.mahle.com">www.mahle.com</a>	all
1.8	16.03.2016	Translation	all
1.9	08.02.2017	Adaption of the Released Parts List Foundry Name change of MAHLE Industriefiltration to Filtration Group. New Logo of Filtration Group. Contact persons have been updated	1, 2, 4, 5
2.0	01.01.2018	Mechanical specifications revised (Version 2.0)	all
2.1	01.01.2019	Mechanical specifications revised (Version 2.1) Contact persons updated	all
2.3	25.11.2021	Mechanical specifications revised (Version 2.3) Contact persons updated, links updated, product pictures and design updated	all

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### 3 Notes

The following release list is based on the current edition of the Mechanical Specifications for Component Production of the Volkswagen Group. The respective requirements and restrictions must be complied with.

#### 3.1 Hydraulic filter for low flammable liquids

This mechanical approval list for the **foundry productions** of the Volkswagen Corporation includes hydraulic components for systems with pressure fluids of low flammability of the group HFC; e.g. diecasting machines. The requirements for the hydraulic filters for liquids of low flammability conform to the requirements of hydraulic filters for mineral oil-based pressure fluids (see Mechanical Approval List for the Engine, Transmission, Chassis Productions 3.1). Changes to the structural design are noted separately in the text of this document:

##### **Fluid**

A fluid of low flammability of the group HFC is specified:

Petrofer ULTRA-SAFE 620 VW-Kassel with the following physical data:

Density according to DIN 51757	at 20 °C:	1.05
Viscosity according to DIN 51562	at 20 °C:	94 mm <sup>2</sup> /s
	at 40 °C:	43 mm <sup>2</sup> /s
	at 50 °C:	31 mm <sup>2</sup> /s
Viscosity index:	>>150	
Flash point according to ISO 2592:	None	
Pour point according to ISO 3016:	-50 °C	
Ash content:	0.05 %	
Spec. heat:	3.20 KJ/KgK	
Thermal conductivity:	0.38 W/mK	

##### **Filter design**

Due to the increased specific weight and the increased dirt removing capability of this fluid, the recommended volume flows in the selection tables for the return filter and the pressure filter for application in foundry machines are reduced by 20%.

This corresponds to a lower initial delta-P.

No reduction of the volume flow is specified for the partial flow.

##### **General design of the filter**

Pressure filters with nominal sizes 250 and 400 according to DIN 24550 must be designed with elements removable to the top. A ventilation option at the highest point and a drain screw is provided on these filter housings.

A non-return valve which may be required to protect the pressure lines from running empty must be provided by the assembly manufacturer.

The service indicators must be provided without integrated cold start suppression.  
(to be implemented by the system builder via machine control system)

The materials of the filters listed in the following must be resistant to the specified fluid.  
Seals are made from NBR

In the case of larger oil pendulum volumes in the pressure fluid tank, the number of approved air filters must be adjusted accordingly.

## 4 Overview

### 4.1 Hydraulic filters for low flammable liquids

#### 4.1.1 Return-line filter line installation as simplex filter according to DIN 24550

- Maximum volume flows at 43 mm<sup>2</sup>/s; initial  $\Delta p$  of the complete filter in pure state in bar
- Oil purity according to ISO 4406:1999/purity class 17/15/11  $\rightarrow \beta_{10}(c) \geq 200$
- Complete filter designation includes visual/electr. maintenance indicator with LEDs, 2 setting points 75/100 % and connector M12x1, seals in NBR



NG	Recommended volume flow	Resistance to collapsing $\Delta p$ 20 bar replacement element	ND housing	Complete filter designation simplex filter	Document in Online-Shop
100	32	Pi 23010 DN PS 10 Mat.No. 77925597	63	Pi 20010-058/PiS 3154-2,2/Pi 23010 DN PS 10 Mat.No. 70347162	<a href="#">Pi 2000 to NG 400</a>
160	68	Pi 23016 DN PS 10 Mat.No. 77925605	25	Pi 20016-058/PiS 3154-2,2/Pi 23016 DN PS 10 Mat.No. 70347163	<a href="#">Pi 2000 to NG 400</a>
250	96	Pi 23025 DN PS 10 Mat.No. 77925613	25	Pi 20025-058/PiS 3154-2,2/Pi 23025 DN PS 10 Mat.No. 76332449	<a href="#">Pi 2000 to NG 400</a>
400	108	Pi 23040 DN PS 10 Mat.No. 77925621	25	Pi 20040-058/PiS 3154-2,2/Pi 23040 DN PS 10 Mat.No. 76938880	<a href="#">Pi 2000 to NG 400</a>

- Maximum volume flows at 43 mm<sup>2</sup>/s; initial  $\Delta p$  of the complete filter in pure state max. 0.4 bar
- Oil purity according to ISO 4406:1999/purity class 14/12/09  $\rightarrow \beta_5(c) \geq 200$
- The complete filter designation includes the visual/electr. maintenance indicator with LEDs, 2 setting points 75/100 % and connector M12x1

NG	Recommended volume flow	Resistance to collapsing $\Delta p$ 20 bar replacement element	ND housing	Complete filter designation with M 12x1 simplex filter	Document in Online-Shop
100	16	Pi 21010 DN PS 3 Mat.No. 78227472	63	Pi 20010-058/PiS 3154-2,2/Pi 21010 DN PS 3 Mat.No. 70347164	<a href="#">Pi 2000 to NG 400</a>
160	36	Pi 21016 DN PS 3 Mat.No. 78261034	25	Pi 20016-058/PiS 3154-2,2/Pi 21016 DN PS 3 Mat.No. 70347165	<a href="#">Pi 2000 to NG 400</a>
250	56	Pi 21025 DN PS 3 Mat.No. 78227514	25	Pi 20025-058/PiS 3154-2,2/Pi 21025 DN PS 3 Mat.No. 70347167	<a href="#">Pi 2000 to NG 400</a>
400	68	Pi 21040 DN PS 3 Mat.No. 78227522	25	Pi 20040-058/PiS 3154-2,2/Pi 21040 DN PS 3 Mat.No. 76952931	<a href="#">Pi 2000 to NG 400</a>

Spare parts list for filters according to 4.1.1:

Housing type designation	Housing gasket set NBR	Maintenance indicator gasket set NBR	Document in Online-Shop
Pi 20010	Mat.No. 79328485	Mat.No. 77760309	<a href="#">Pi 2000 to NG 400</a>
Pi 20016 - Pi 20040	Mat.No. 79357617	Mat.No. 77760309	<a href="#">Pi 2000 to NG 400</a>

#### 4.1.2 Tank-Top Return-line as simplex filter according to DIN 24550

- Maximum volume flows at 46 mm<sup>2</sup>/s; initial  $\Delta p$  of the complete filter in pure state max. 0,5 bar
- Oil purity according to ISO 4406:1999/purity class 17/15/11 →  $\beta_{10}(c) \geq 200$
- The complete filter designation includes the visual/electr. maintenance indicator with LEDs, 2 setting points 75/100 % and connector M12x1



NG	Recommended volume flow	Resistance to collapsing $\Delta p$ 20 bar replacement element	ND housing	Complete filter designation simplex filter	Document in Online-Shop
100	52	Pi 23010 RN PS 10 Mat.No. 77924046	10	Pi 50010-058/PiS 3153-2,2/Pi 23010 RN PS 10 Mat.No. 72377884	<a href="#">Pi 5000 to NG 100</a>
160	92	Pi 23016 RN PS 10 Mat.No. 77924145	10	Pi 50016-058 HF/PiS 3153-2,2/Pi 23016 RN PS 10 Mat.No. 72377899	<a href="#">Pi 5000 to NG 100</a>
250	128	Pi 23025 RN PS 10 Mat.No. 77924160	10	Pi 50025-058HF/PiS 3153-2,2/Pi 23025 RN PS 10 Mat.No. 72377924	<a href="#">Pi 5000 NG 160-1000</a>
400	192	Pi 23040 RN PS 10 Mat.No. 77924186	10	Pi 50040-058HF/PiS 3153-2,2/Pi 23040 RN PS 10 Mat.No. 72377932	<a href="#">Pi 5000 NG 160-1000</a>



- Maximum volume flows at 43 mm<sup>2</sup>/s; initial  $\Delta p$  of the complete filter in pure state max. 0.4 bar
- Oil purity according to ISO 4406:1999/purity class 14/12/09  $\rightarrow \beta_5 (c) \geq 200$
- The complete filter designation includes the visual/electr. maintenance indicator with LEDs, 2 setting points 75/100 % and connector M12x1

NG	Recommended volume flow [l/min]	Resistance to collapsing $\Delta p$ 20 bar replacement element	ND housing	Complete filter designation with M 12x1 simplex filter	Document in Online-Shop
100	32	Pi 21010 RN PS 3 Mat.No. 77924038	10	Pi 50010-058/PiS 3153-2,2/Pi 21010 RN PS 3 Mat.No. 72377895	<a href="#">Pi 5000 to NG 100</a>
160	52	Pi 21016 RN PS 3 Mat.No. 77924137	10	Pi 50016-058 HF/PiS 3153-2,2/Pi 21016 RN PS 3 Mat.No. 72377900	<a href="#">Pi 5000 NG 160-1000</a>
250	80	Pi 21025 RN PS 3 Mat.No. 77924152	10	Pi 50025-058 HF/PiS 3153-2,2/Pi 21025 RN PS 3 Mat.No. 72377927	<a href="#">Pi 5000 NG 160-1000</a>
400	116	Pi 21040 RN PS 3 Mat.No. 77924178	10	Pi 50040-058 HF/PiS 3153-2,2/Pi 21040 RN PS 3 Mat.No. 72377933	<a href="#">Pi 5000 NG 160-1000</a>

Spare parts list for filters according to 4.1.2:

Housing type designation	Housing gasket set	Maintenance indicator gasket set	Document in Online-Shop
Pi 50010	Mat.No. 77999709	Mat.No. 78383382	<a href="#">Pi 5000 to NG 100</a>
Pi 50016 - Pi 50025	Mat.No. 78227902	Mat.No. 78383382	<a href="#">Pi 5000 NG 160-1000</a>
Pi 50040	Mat.No. 77227936	Mat.No. 78383382	<a href="#">Pi 5000 NG 160-1000</a>

### 4.1.3 Pressure filter line installation as simplex filter according to DIN 24550

- Maximum volume flows at 43 mm<sup>2</sup>/s; initial  $\Delta p$  of the complete filter in pure state of 0,8 bar
- Oil purity according to ISO 4406:1999/purity class 17/15/11  
→  $\beta_{10}(c) \geq 200$
- The complete filter designation includes the visual/electr. maintenance indicator with LEDs, 2 setting points 75/100 % and connector M12x1, seals in NBR



NG	Recommended volume flow [l/min]	Resistance to collapsing $\Delta p$ 210 bar replacement element	ND housing	Complete filter designation simplex filter	Document in Online-Shop
100	44	Pi 73010 DN PS vst 10 Mat.No. 77925670	315	Pi 30010-015/PiS 3155-5,0/Pi 73010 DN PS vst 10 Mat.No. 76333645	<a href="#">Pi 3000 to NG 400</a>
100	44	Pi 73010 DN PS vst 10 Mat.No. 77925670	400	Pi 40010-015/PiS 3155-5,0/Pi 73010 DN PS vst 10 Mat.No. 76321723	<a href="#">Pi 4000 to NG 400</a>
160	100	Pi 73016 DN PS vst 10 Mat.No. 77925688	200	Pi 30016-015/PiS 3155-5,0/Pi 73016 DN PS vst 10 Mat.No. 76317259	<a href="#">Pi 3000 to NG 400</a>
160	100	Pi 73016 DN PS vst 10 Mat.No. 77925688	400	Pi 40016-015/PiS 3155-5,0/Pi 73016 DN PS vst 10 Mat.No. 70348174	<a href="#">Pi 4000 to NG 400</a>
250	144	Pi 73025 DN PS vst 10 Mat.No. 77925696	315	Pi 423025-015/PiS 3155-5,0/Pi 73025 DN PS vst 10 Mat.No. 70390193	<a href="#">Pi 4230 to NG 400</a>
400	176	Pi 73040 DN PS vst 10 Mat.No. 77930829	315	Pi 423040-015/PiS 3155-5,0/Pi 73040 DN PS vst 10 Mat.No. 70390194	<a href="#">Pi 4230 to NG 400</a>

- Maximum volume flows at 43 mm<sup>2</sup>/s; initial  $\Delta p$  of the complete filter in pure state max 0,8 bar
- Oil purity according to ISO 4406:1999/purity class 14/12/09  $\rightarrow \beta_5 (c) \geq 200$
- The complete filter designation includes the visual/electr. maintenance indicator with LEDs, 2 setting points 75/100 % and connector M12x1

NG	Recommend- ed volume flow [l/min]	Resistance to collapsing $\Delta p$ 210 bar replacement element	ND housing	Complete filter designation simplex filter	Document in Online-Shop
100	28	Pi 71010 DN PS vst 3 Mat.No. 78227480	315	Pi 30010-015/PiS 3155-5,0/Pi 71010 DN PS vst 3 Mat.No. 70348167	<a href="#">Pi 3000</a> <a href="#">to NG 400</a>
100	28	Pi 71010 DN PS vst 3 Mat.No. 78227480	400	Pi 40010-015/PiS 3155-5,0/Pi 71010 DN PS vst 3 Mat.No. 70348176	<a href="#">Pi 4000</a> <a href="#">to NG 400</a>
160	56	Pi 71016 DN PS vst 3 Mat.No. 77940638	200	Pi 30016-015/PiS 3155-5,0/Pi 71016 DN PS vst 3 Mat.No. 70348170	<a href="#">Pi 3000</a> <a href="#">to NG 400</a>
160	56	Pi 71016 DN PS vst 3 Mat.No. 77940638	400	Pi 40016-015/PiS 3155-5,0/Pi 71016 DN PS vst 3 Mat.No. 70348177	<a href="#">Pi 4000</a> <a href="#">to NG 400</a>
250	96	Pi 71025 DN PS vst 3 Mat.No. 77940646	315	Pi 423025-015/PiS 3155-5,0/Pi 71025 DN PS vst 3 Mat.No. 70390195	<a href="#">Pi 4230</a> <a href="#">to NG 400</a>
400	144	Pi 71040 DN PS vst 3 Mat.No. 77940653	315	Pi 423040-015/PiS 3155-5,0/Pi 71040 DN PS vst 3 Mat.No. 70390196	<a href="#">Pi 4230</a> <a href="#">to NG 400</a>

Spare parts list for filters according to 4.2.2:

Housing type designation	Housing gasket set NBR	Maintenance indicator gasket set NBR	Document in Online-Shop
Pi 30010	Mat.No. 78383747	Mat.No. 77760275	<a href="#">Pi 3000 to NG 400</a>
Pi 30016	Mat.No. 78383770	Mat.No. 77760275	<a href="#">Pi 3000 to NG 400</a>
Pi 40010	Mat.No. 78383804	Mat.No. 77760275	<a href="#">Pi 4000 to NG 400</a>
Pi 40016	Mat.No. 78383838	Mat.No. 77760275	<a href="#">Pi 4000 to NG 400</a>
Pi 423025 - Pi 423040	Mat.No. 70382630	Mat.No. 77760275	<a href="#">Pi 4230 to NG 400</a>

#### **4.1.4 Bypass filter line installation as simplex filter with filter elements acc. to DIN 24550**

Design as bypass filters for hydraulic fluids on the basis of mineral oil

See: Filtration Group Released Parts List Mechanics\_Volkswagen Group\_2019\_01\_01\_en (4.1.6)

#### **4.1.5 Air Breather filter according to DIN 24557 with filling protection**

Design as breather filters for hydraulic fluids on the basis of mineral oil

See: Filtration Group\_Released Parts List Mechanics\_Volkswagen Group\_2019\_01\_01\_en (4.1.7)

#### **4.1.6 Filling Filter**

Design as filling filters for hydraulic fluids on the basis of mineral oil

See: Filtration Group\_Released Parts List Mechanics\_Volkswagen Group\_2019\_01\_01\_en (4.1.8)

## 5 Data sheets

Access data sheets via the respective hyperlink in the relevant tables (document).

### 5.1 Data sheets filter elements according to DIN 24550



Designation	Document in Online-Shop
Filter elements for line filter according to DIN 24550	<a href="#"><u>Filter elements for liquid filters</u></a>

### 5.2 Data sheets maintenance indicators



Designation	Document in Online-Shop
Maintenance indicators PiS 3153, PiS 3154 and PiS 3155	<a href="#"><u>Maintenance indicators</u></a>