In-line Twin Pump

Type Series Booklet

Omega DSL

Legal information/Copyright

Type Series Booklet Omega DSL

Contents

Heating / Air-conditioning / Ventilation

In-line Twin Pumps

Omega DSL

Main applications

- Heating systems
- Air-conditioning systems
- Cooling circuits
- Water supply systems
- Service water supply systems
- Industrial recirculation systems

Fluids handled

- Fluids not chemically or mechanically aggressive to the materials

Further information on fluids handled

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m³/h]	150
	Q [l/s]	42
Head	H [m]	21
Fluid temperature	T [°C]	-15 to +120
Operating pressure	p [bar]	≤ 10 [1]

[1] The sum of inlet pressure and shut-off head must not exceed the value indicated.

Designation

Example: OMDL 032-032-080 GG X AV 11 D 2

Designation key

Code	Description	
OMDL	Pump type	
	OMDL	Omega DSL
032	Nominal suction nozzle diameter [mm]	
032	Nominal discharge nozzle diameter [mm]	
080	Nominal impeller diameter [mm]	
G	Casing material	
	G	Grey cast iron
G	Impeller material if different from casing material	
	G	Grey cast iron
	P	Polysulphone
X	Additional code	
	X	Special design BT3D, BT3
A	Casing cover	
	A	Conical seal chamber
V	Sealing system	
	V	Conical seal chamber with vent
	A	Conical seal chamber
11	Seal code	
	11	Mechanical seal material BQ1EGG
D	Scope of supply	
	D	Pump with motor
2	Shaft unit	
	2	SU 12
	3	SU 14
	6	SU 16

Further information on the designation

[⇨Page 33]

Design details

Design

- Close-coupled design/in-line design
- Single-stage
- Horizontal/vertical installation
- Rigid connection between pump and motor

Pump casing

- Radially split volute casing

Impeller type

- Closed radial impeller

Shaft seal

- Mechanical seal
- Grease lubrication

Bearings

- Radial ball bearing in the motor housing
- Grease lubrication

Drive

- Surface-cooled standard squirrel-cage motor

Winding	Up to 1.1 kW, 220-240 V single-phase / 380-420 V three-phase From 1.8 kW 380-420 V
Type of construction	IM V1
Enclosure	IP55
Thermal class	F
Efficiency class	IE3
Mode of operation	Continuous operation S1

Automation

Automation options:

- Frequency converter

Materials

Overview of available materials

Part No.	Description	Material	Material variant	
			GG	GP
102	Volute casing	Grey cast iron EN-GJL 150 / EN-GJL 200	✗	✗
230	Impeller	Grey cast iron EN-GJL-150	✗	-
		Polysulphone PSU-GF30	-	✗
341	Drive lantern	Aluminium AC-46500	✗	✗
412.50	O-ring	EPDM	✗	✗
554.03	Washer	CW508L	✗	✗
580	Cap, conical	Polyamide 66	✗	✗
914.21	Hexagon socket head cap screw	A4	✗	✗

Coating and preservation

- Coating and preservation to DP standard

Product benefits

- Improved efficiency and $NPSH_{req}$ by experimentally verified hydraulic design of impellers (vanes)
- Low energy costs through compliance with Commission Regulation 547/2012 (minimum efficiency index MEI ≥ 0.4)
- Operating costs reduced by trimming the impeller diameter to match the specified duty point
- Little wear, low vibration levels and excellent smooth running characteristics thanks to good suction performance and virtually cavitation-free operation across a wide operating range
- Casing sealed reliably – even in varying operating conditions – by confined casing gasket
- Large variety of materials for perfectly matching the pump to the fluid handled. Large range of materials for many applications available as standard.
- Low-noise low-vibration motors specially designed for Omega SL. Also available as 2-pole motors.

Product information as per Regulation No. 547/2012 (for water pumps with a maximum shaft power of 150 kW) implementing "Ecodesign" Directive 2009/125/EC

- Minimum efficiency index: see data sheet
- The benchmark for the most efficient water pumps is MEI ≥ 0.70.
- Year of construction: see data sheet
- Manufacturer’s name or trade mark, commercial registration number and place of manufacture: see data sheet or order documentation
- Product’s type and size identificator: see data sheet
- Hydraulic pump efficiency (%) with trimmed impeller: see data sheet
- Pump performance curves, including efficiency characteristics: see documented characteristic curve

- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with full impeller diameter. Trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.
- Operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system.
- Information relevant for disassembly, recycling or disposal at end of life: see installation/operating manual
- Information on benchmark efficiency or benchmark efficiency graph for MEI = 0.70 (0.40) for the pump based on the model shown in the Figure are available at: http://www.europump.org/efficiencycharts

Acceptance tests and warranty

Acceptance tests and warranty	Note
Materials inspection and testing	– Test report 2.2 on request
Hydraulic test	– The duty point of each pump with a delivery address or final destination in Europe is guaranteed to ISO 9906/3B.
Other inspections/tests on request	
Warranty	– Warranties are given within the scope of the valid terms and conditions of sale and delivery.

Overview of fluids handled

Table of fluids handled and associated material combinations

✘ = standard

Fluid handled	Application limits	Casing materials	Shaft seal		Comments
		Grey cast iron/ grey cast iron	BQ1EGG	Q_5Q_1EGG	
	[°C]	G	11	14[2]	
Service water		✘	✘	-	
Heating water[3]		✘	✘	-	
Condensate		✘	✘	-	
Cooling water (without antifreeze)	≤ +60	✘	✘	-	Open circuit: B required
Cooling water: pH ≥ 7.5 (with antifreeze)	≥ -30 to +60	✘	✘	-	
Cooling water: pH ≥ 7.5 (with antifreeze)	≥ +60 to +110	✘	-	✘	
Pure water	≤ +60	✘	✘	-	
Partly desalinated water	≤ +120	✘	✘	-	
Fully desalinated (deionised) water, boiler feed water	≤ +110	✘	✘	-	
Cooling brine, inorganic; pH value > 7.5, inhibited	≥ -30 to +25	✘	✘	-	
Water with antifreeze, pH value ≥ 7.5	≥ -30 to +60	✘	✘	-	
Water with antifreeze, pH value ≥ 7.5	≥ +60 to +120	✘	-	✘	

[2] Special design

[3] Treatment to VdTÜV 1466; additional requirement: O2 ≤ 0.02 mg/l

Pressure limits and temperature limits

Pressure limits and temperature limits depending on the material variant

Material variant	Fluid temperature[4]	Test pressure[5]	Operating pressure
	[°C]	[bar]	[bar]
GG, GP	-15 to +120	≤ 15	≤ 10

[4] For hot water heating systems to DIN 4752, Section 4.5, application limits must be observed.

[5] The casing components are checked for leakage by means of internal pressure tests to AN 1897/75-03D00 with water.

Technical data

Technical data of the motor

n = 2900 rpm

Size	Motor			[kg]
	[kW]	U [V]	I [A]	
032-032-080	0,25	3 x 380-420	0,76	16,1
032-032-080	0,25	1 x 220-240	2	16,7
032-032-100	0,25	3 x 380-420	0,76	27,5
032-032-100	0,25	1 x 220-240	2	27,5
032-032-105	0,55	3 x 380-420	1,6	33,2
032-032-105	0,55	1 x 220-240	4,2	33,0
032-032-125	0,75	3 x 380-420	1,6	33,2
032-032-125	0,75	1 x 220-240	4,75	37,7
040-040-060	0,25	3 x 380-420	0,76	25,3
040-040-060	0,25	1 x 220-240	2	25,9
040-040-090	0,55	3 x 380-420	1,6	29,5
040-040-090	0,55	1 x 220-240	4,2	30,8
040-040-100	0,75	3 x 380-420	1,6	30,7
040-040-100	0,75	1 x 220-240	4,75	35,6
050-050-110	1,1	3 x 380-420	2,25	41,5
050-050-110	1,1	1 x 220-240	6,9	41,5
050-050-125	1,8	3 x 380-420	3,4	46,5
065-065-100	1,1	3 x 380-420	2,25	50,5
065-065-100	1,1	1 x 220-240	6,9	50,5
065-065-115	1,8	3 x 380-420	3,4	56,0
065-065-125	3	3 x 380-420	5,6	64,0
080-080-105	1,1	3 x 380-420	2,25	63,0
080-080-115	1,8	3 x 380-420	3,4	68,5
080-080-125	3	3 x 380-420	5,6	77,0

n = 1450 rpm

Size	Motor			[kg]
	[kW]	U [V]	I [A]	
032-032-125	0,12	3 x 380-420	0,48	28,8
032-032-125	0,12	1 x 220-240	1,2	28,8
040-040-100	0,12	3 x 380-420	0,48	26,7
040-040-100	0,12	1 x 220-240	1,2	27,4
050-050-125	0,18	3 x 380-420	0,66	33,5
050-050-125	0,18	1 x 220-240	1,6	35,0
050-050-160	0,75	3 x 380-420	1,71	60,0
050-050-160	0,75	1 x 220-240	5,75	57,0
065-065-125	0,37	3 x 380-420	1,25	46,0
065-065-125	0,37	1 x 220-240	3,2	46,0
080-080-125	0,37	3 x 380-420	1,25	58,5
080-080-125	0,37	1 x 220-240	3,2	59,0

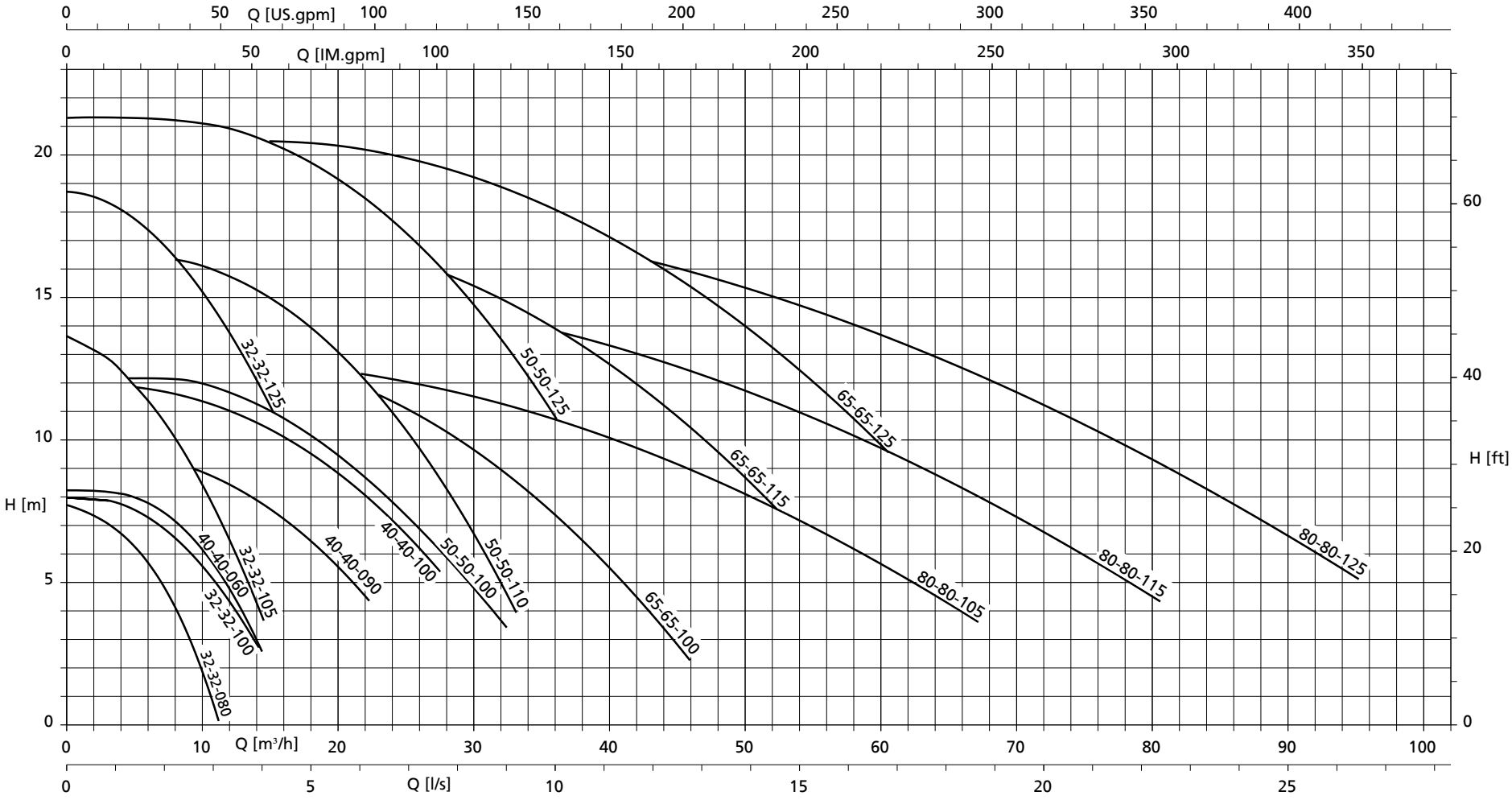
Technical data of the pump

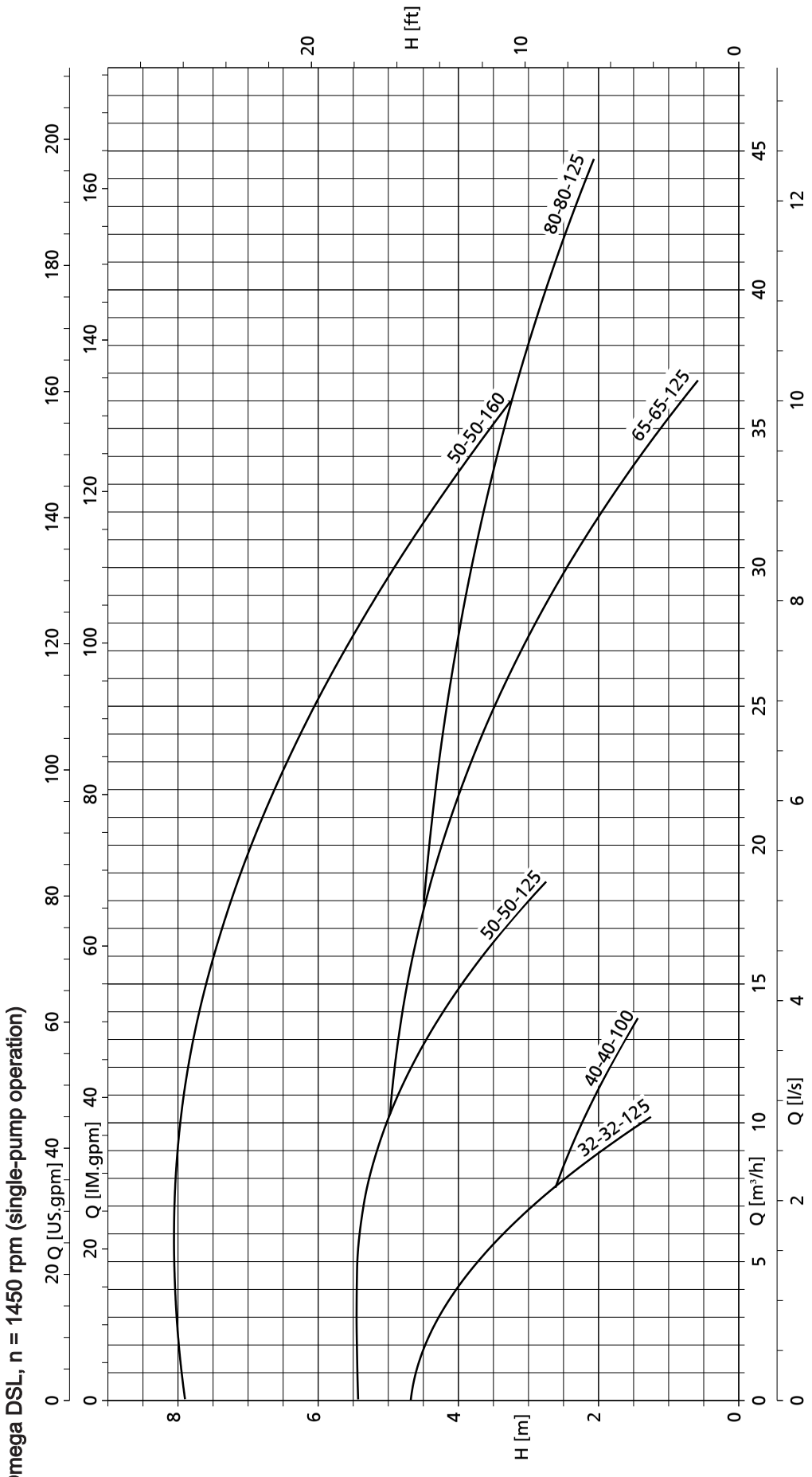
Overview

Size	Shaft unit	Impeller diameter	Speed limit	
			Minimum	Maximum
		[mm]	[rpm]	[rpm]
032-032-80	SU 12	80	500	3000
032-032-100	SU 12	80	500	3000
032-032-105	SU 12	105	500	3000
032-032-125	SU 12	125	500	3000
040-040-60	SU 12	80	500	3000
040-040-90	SU 12	90	500	3000
040-040-100	SU 12	98	500	3000
040-040-100	SU 14	98	500	3000
050-050-110	SU 14	109	500	3000
050-050-125	SU 12	125	500	3000
050-050-125	SU 14	125	500	3000
050-050-160	SU 14	159	500	3000
050-050-160	SU 16	159	500	3000
065-065-100	SU 14	100	500	3000
065-065-115	SU 16	113	500	3000
065-065-125	SU 12	125	500	3000
065-065-125	SU 16	125	500	3000
080-080-105	SU 14	100	500	3000
080-080-115	SU 16	112	500	3000
080-080-125	SU 12	126,5	500	3000
080-080-125	SU 16	126,5	500	3000

Selection charts

Omega DSL, n = 2900 rpm (single-pump operation)




Omega DSL, n = 1450 rpm (single-pump operation)
H [ft]
H [m]
Q [US.gpm]
Q [IM.gpm]
Q [m³/h]
Q [l/s]
80-80-125
50-50-160
65-65-125
50-50-125
40-40-100
32-32-125

Characteristic curves

General

Test class
Characteristic curves to ISO 9906 Class 3B

NPSH values
The NPSH values indicated in the characteristic curves correspond to a head drop of 3 %.

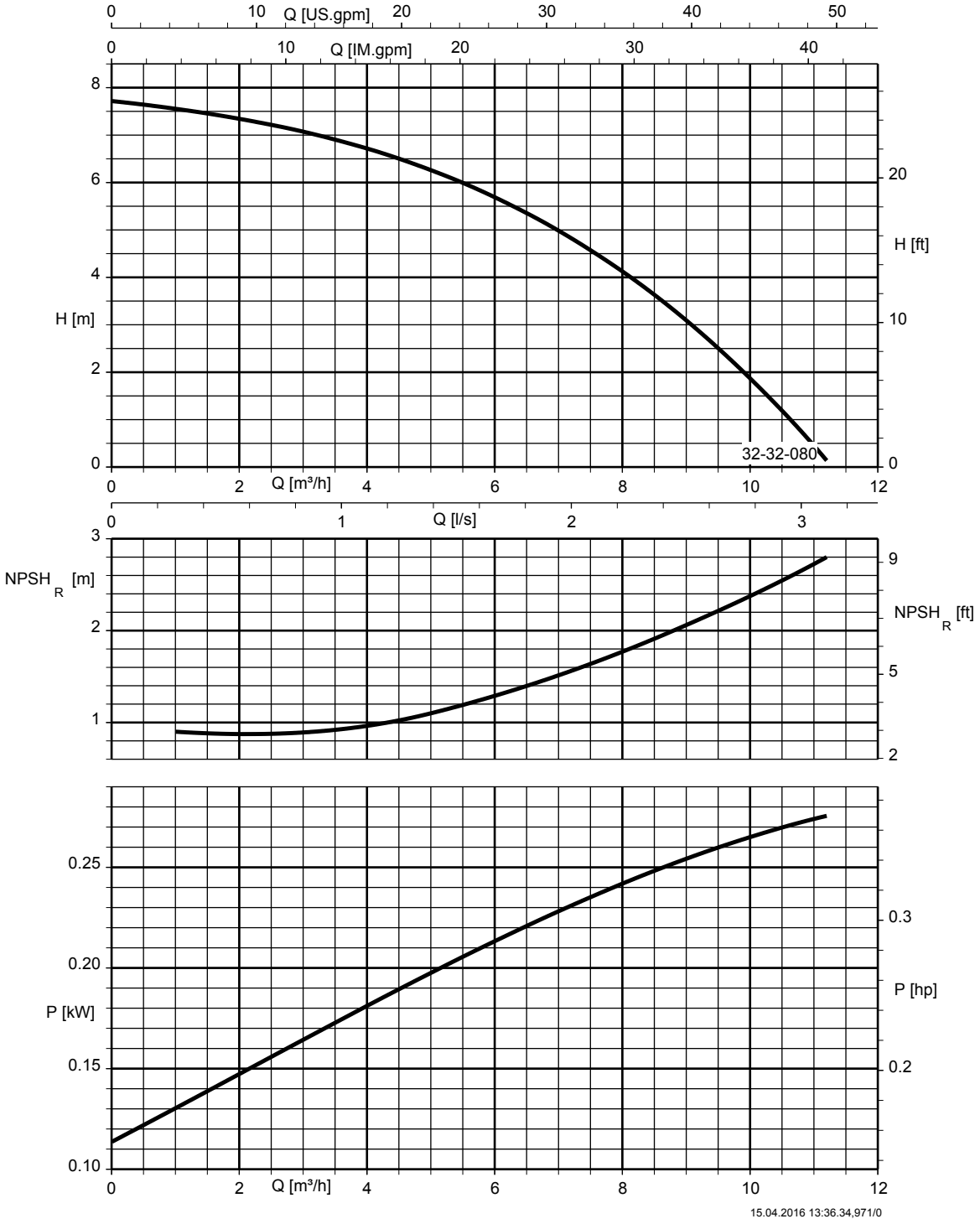
NPSH values in low-flow conditions
NPSH values for flow rates below Q = 0.3 x Q_{opt} can only be measured with intense technical efforts. Evidence of NPSH values in the low-flow range cannot be provided.

Density of the fluid handled
The indicated heads and performance data apply to pumped fluids with a density ρ = 1.0 kg/dm^3 and a kinematic viscosity of up to 20 mm^2/s max. If the density ≠ 1.0, the performance data must be multiplied by ρ. For viscosities >20 mm^2/s the corresponding data for cold water has to be calculated and the impact on the pump's performance has to be determined.

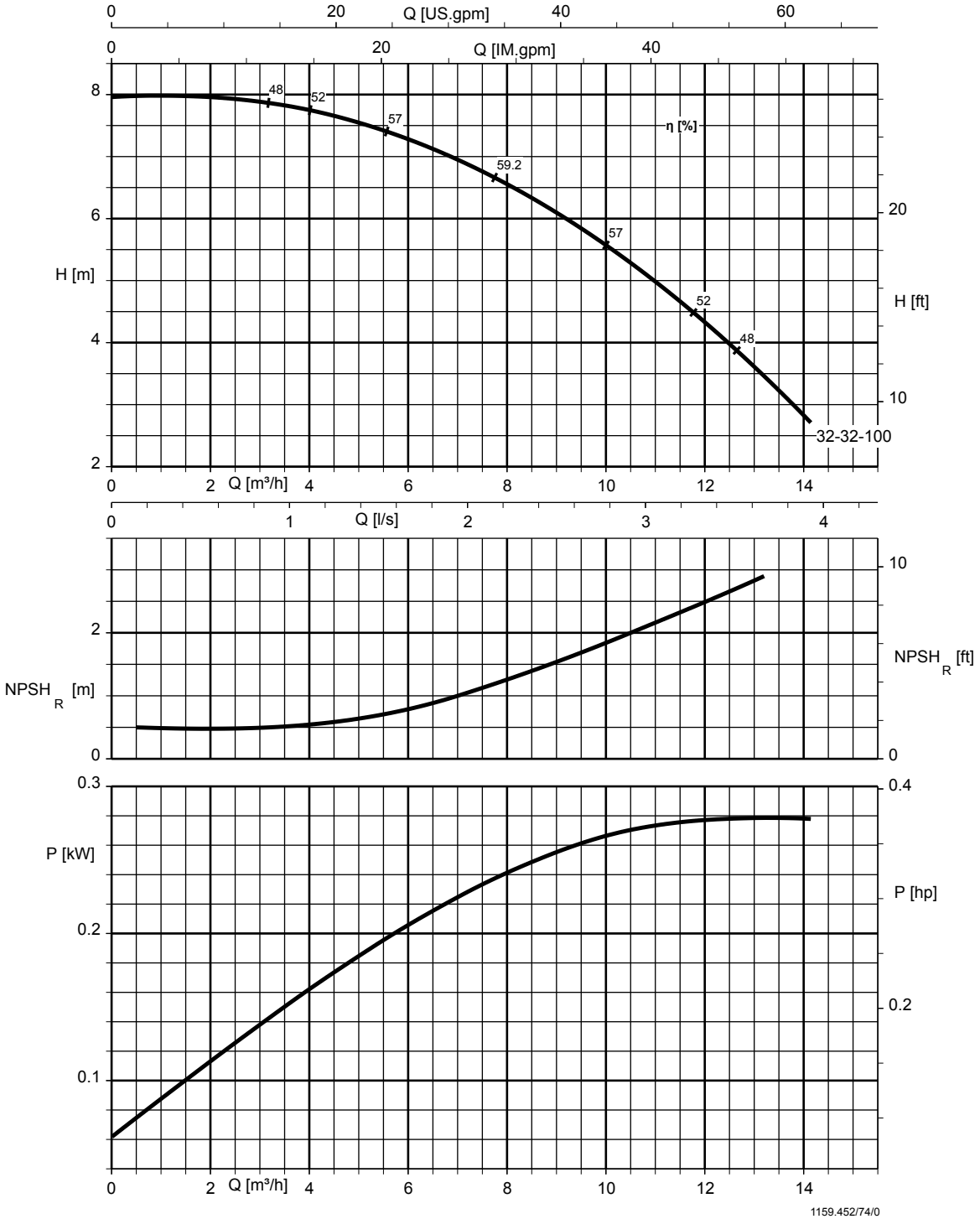
Correction factors
The characteristic curves apply to pumps with cast iron or bronze impellers. When using an impeller made of cast steel materials the efficiency and pump power of the corresponding pump sizes have to be multiplied by the correction factors indicated in the characteristic curves.

Omega DSL, n = 2900 rpm

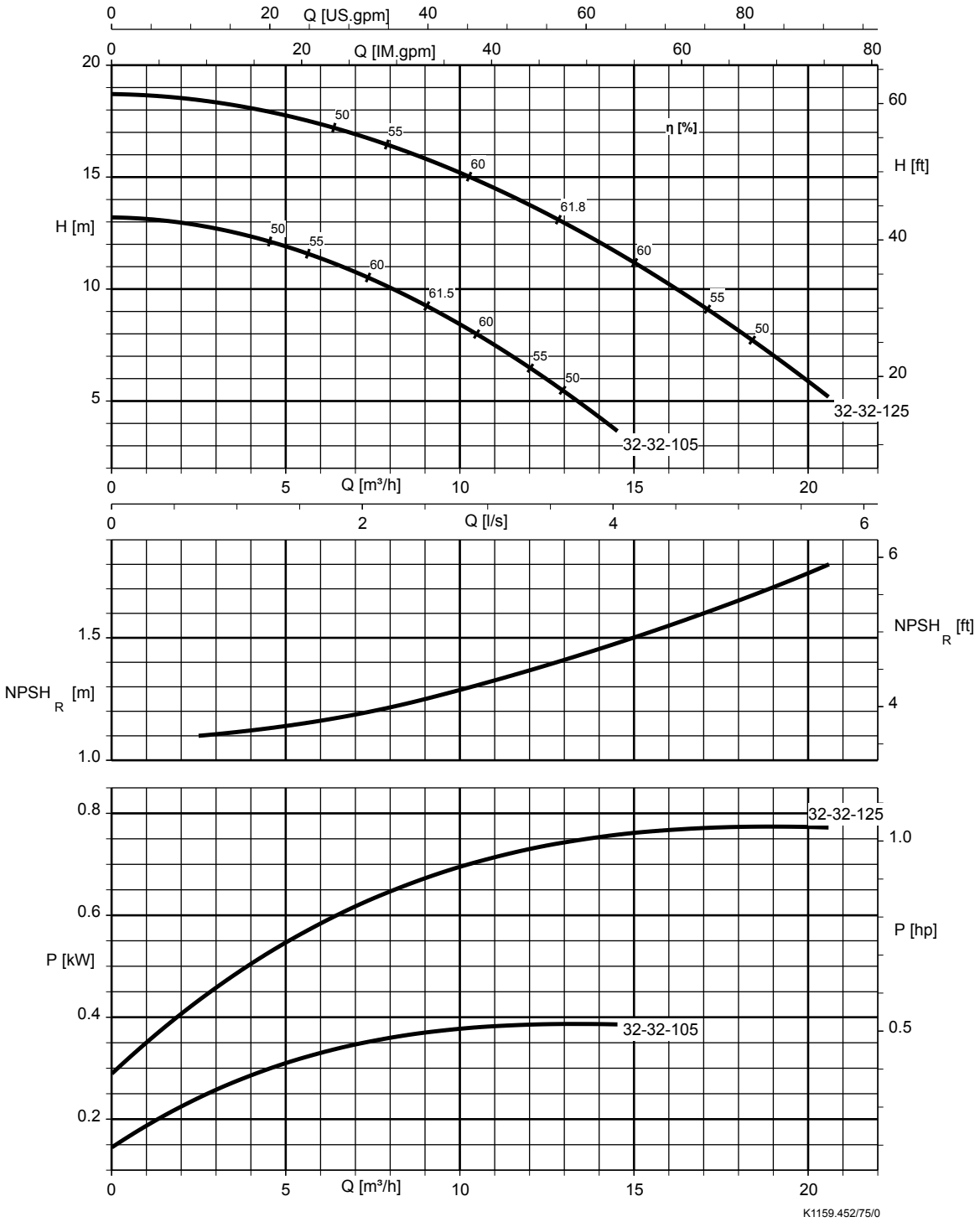
Omega DSL 32-32-080, n = 2900 rpm



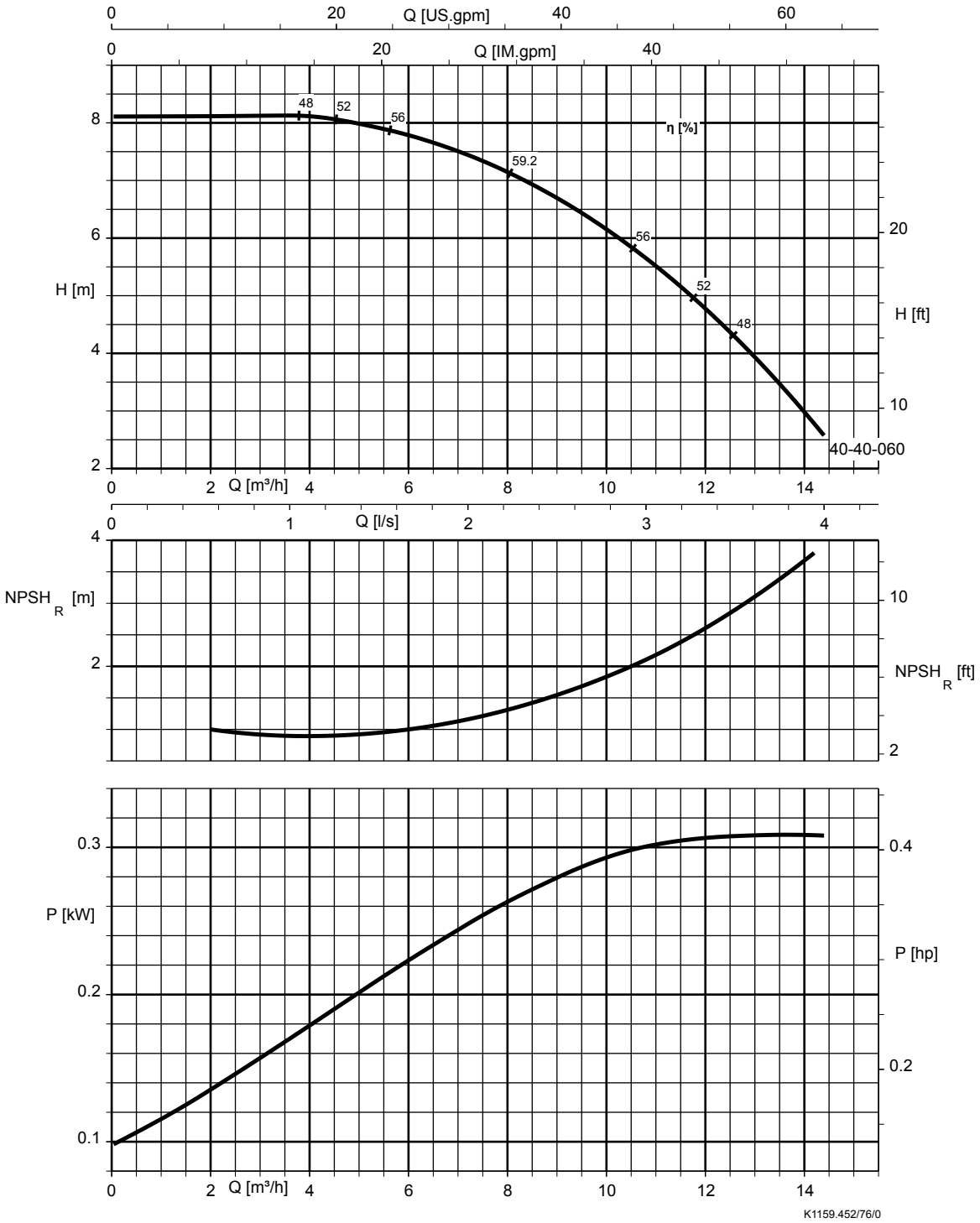
Omega DSL 32-32-100, n = 2900 rpm



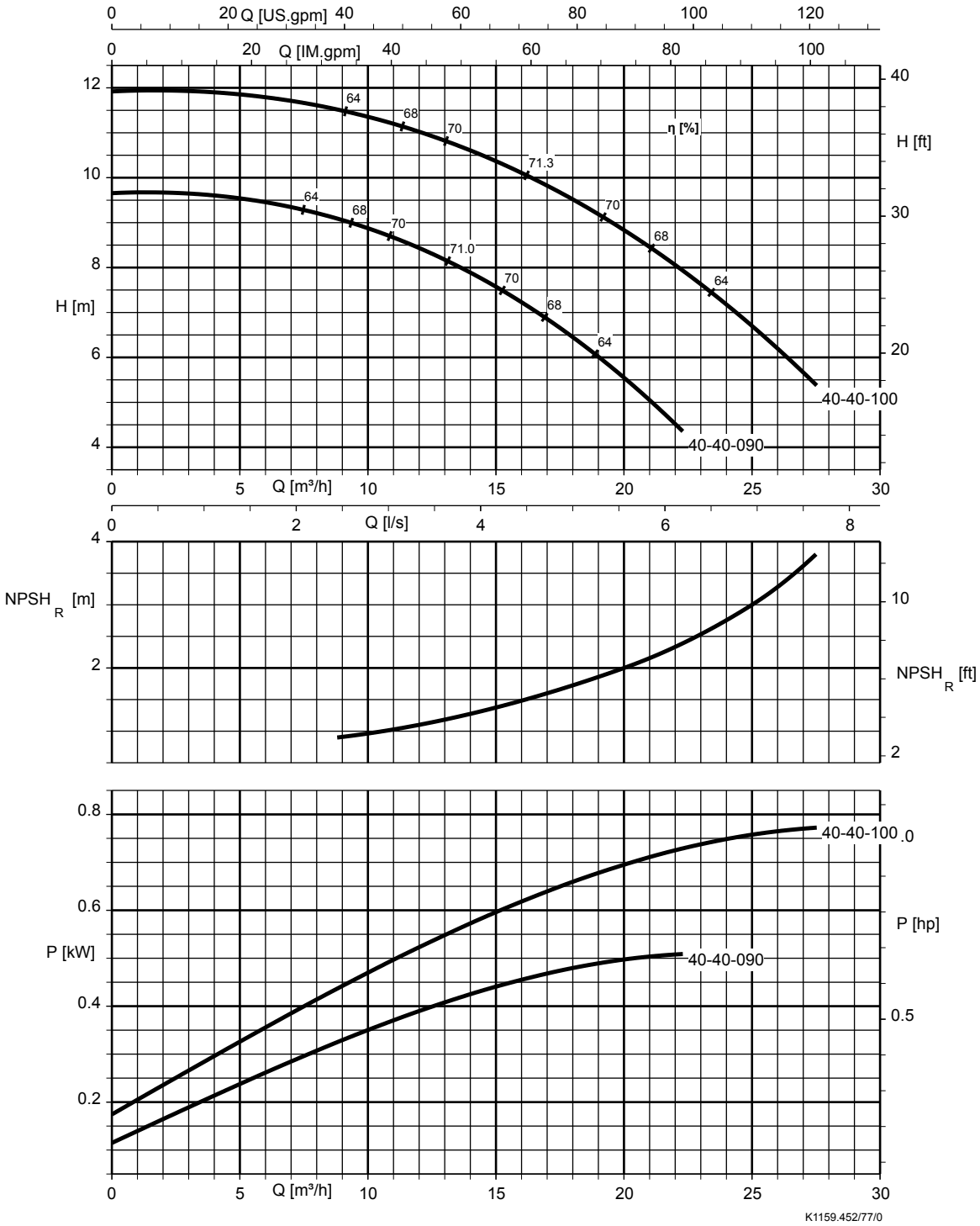
Omega DSL 32-32-125, n = 2900 rpm



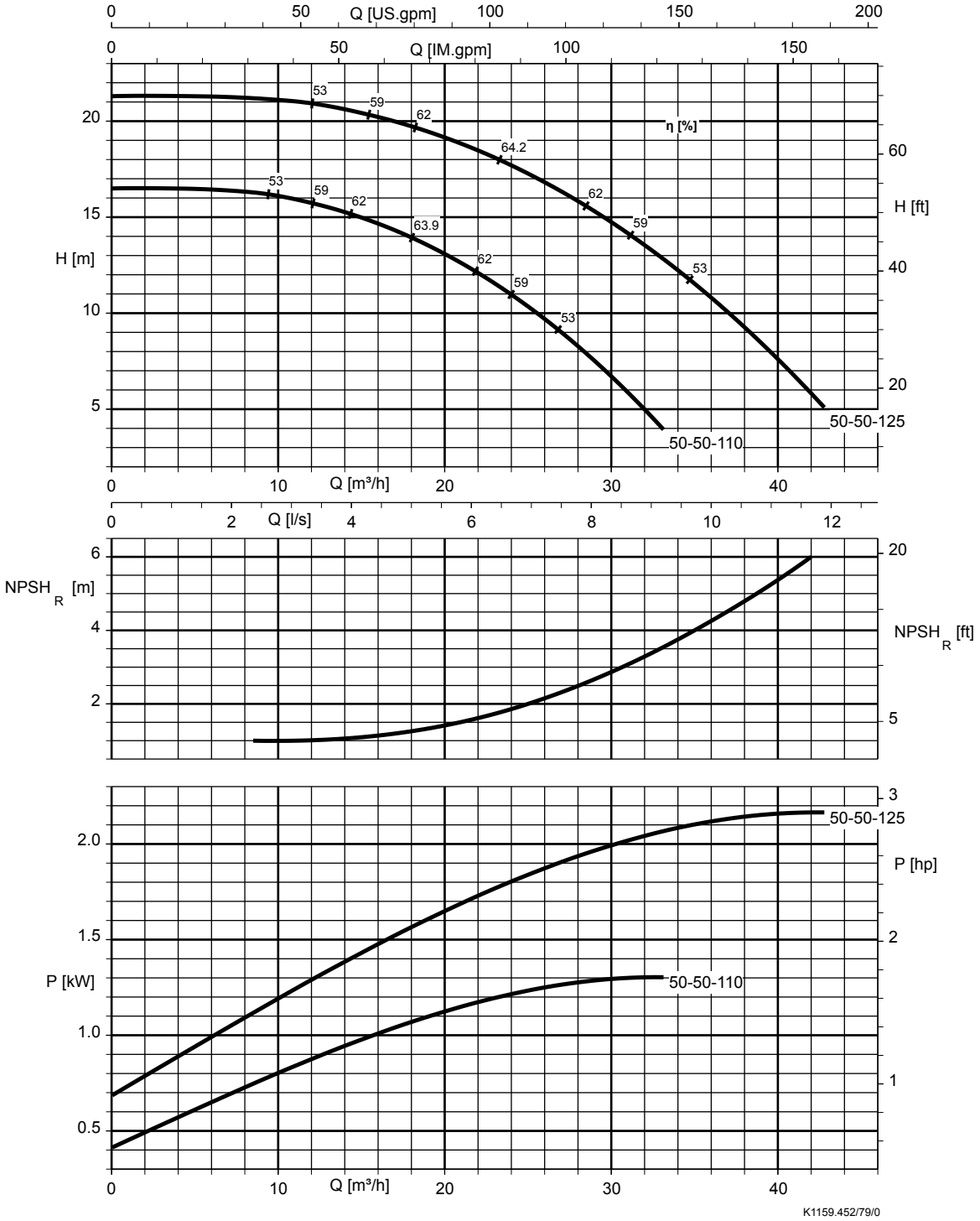
Omega DSL 40-40-060, n = 2900 rpm



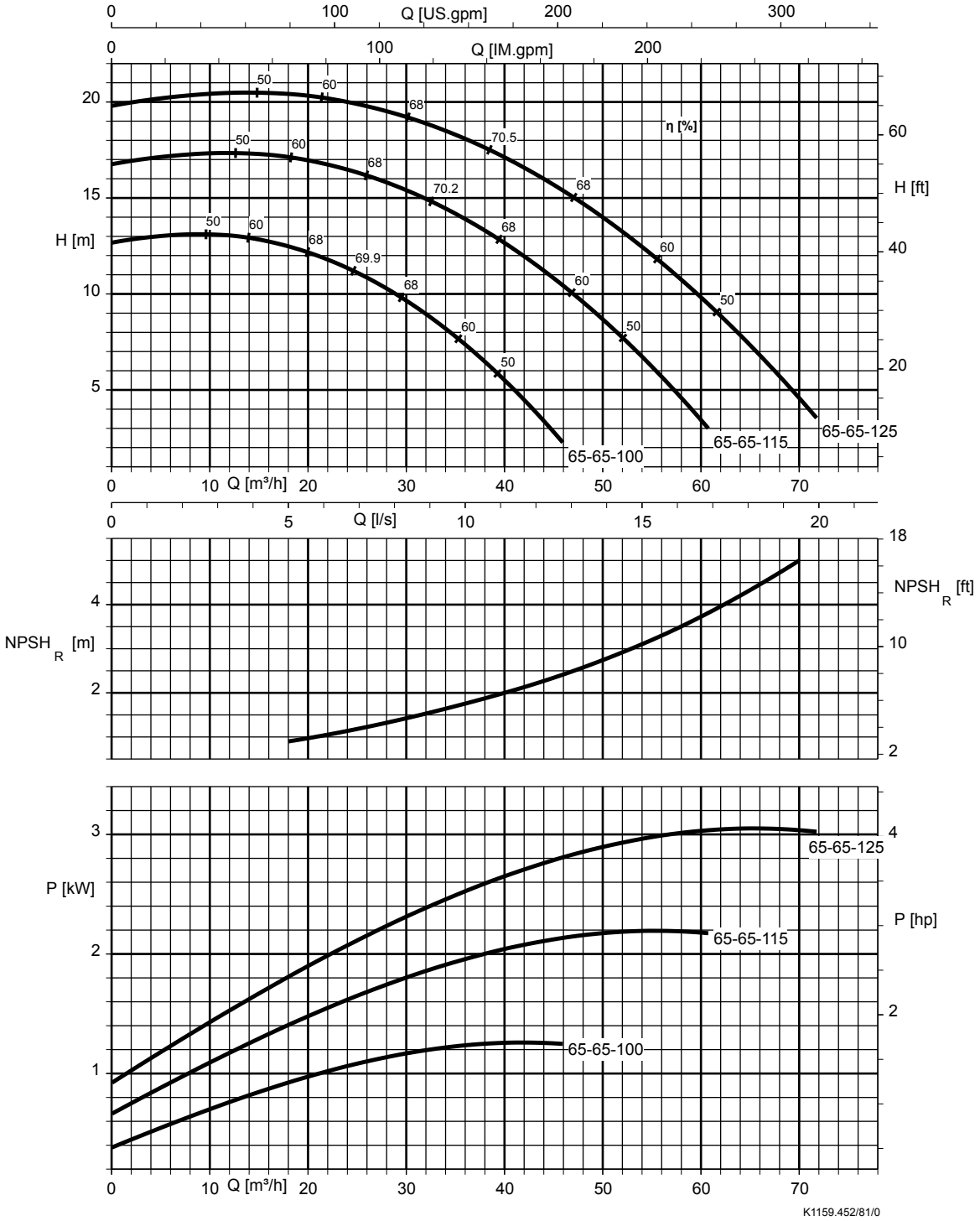
Omega DSL 40-40-100, n = 2900 rpm



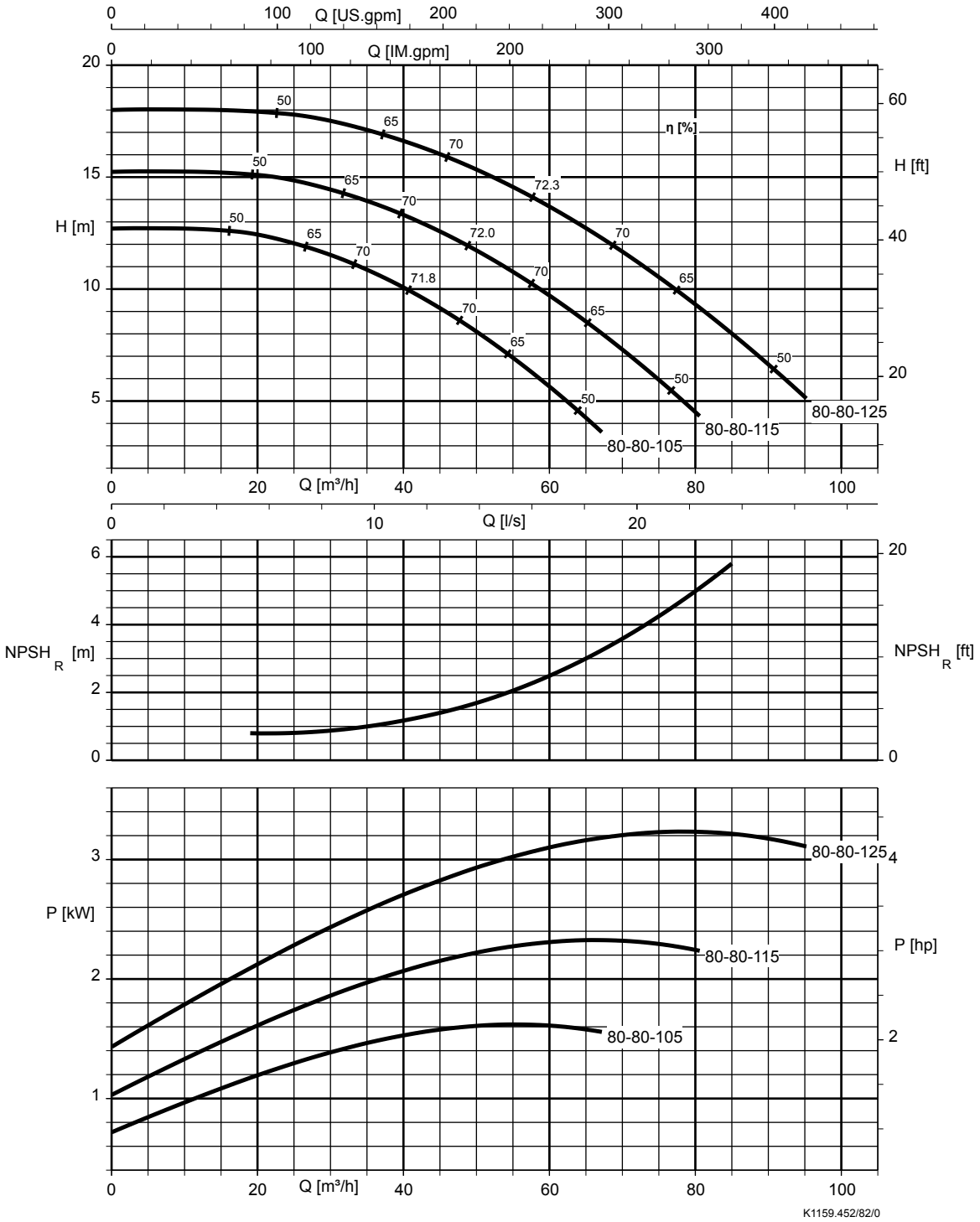
Omega DSL 50-50-125, n = 2900 rpm



Omega DSL 65-65-125, n = 2900 rpm

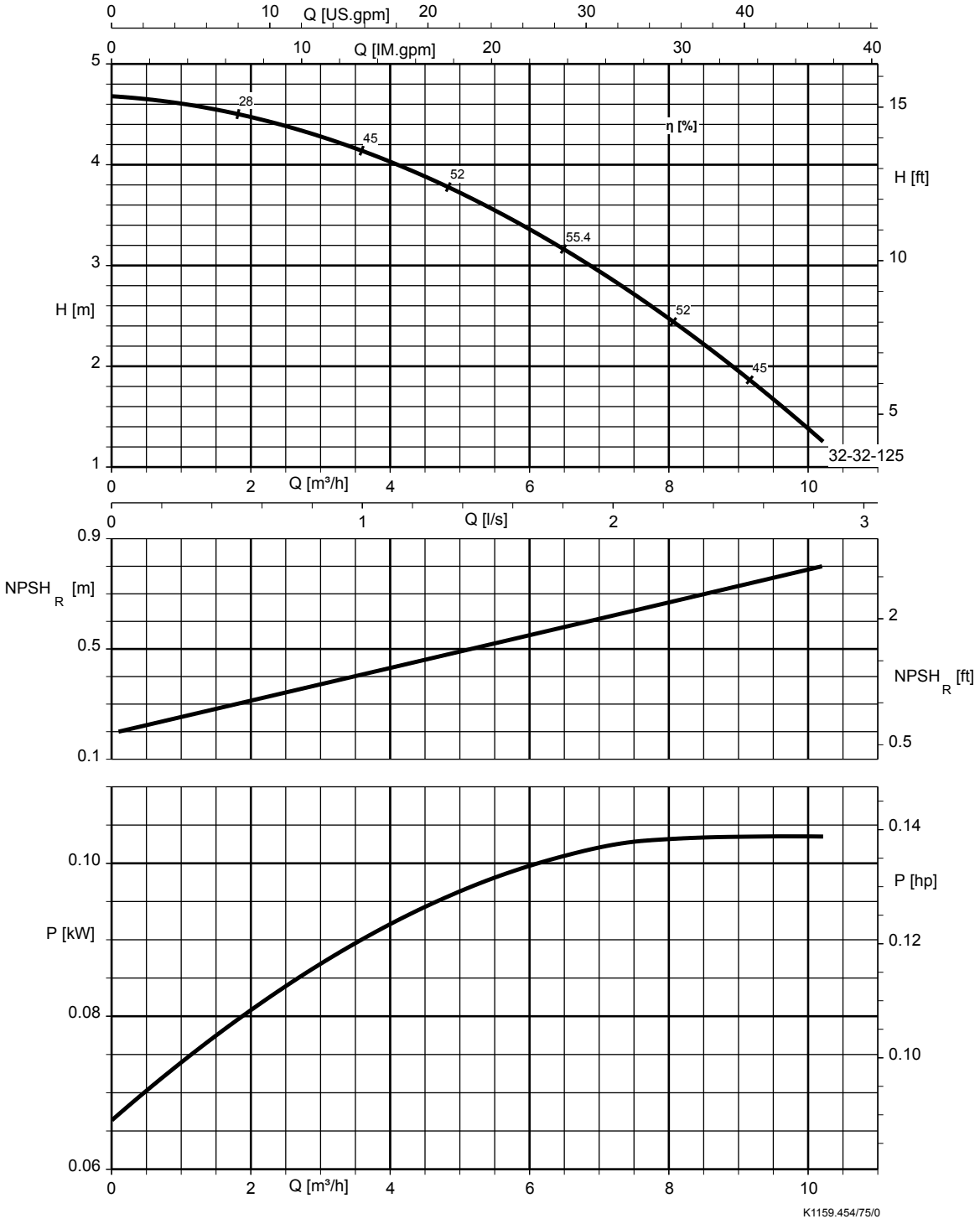


Omega DSL 80-80-125, n = 2900 rpm

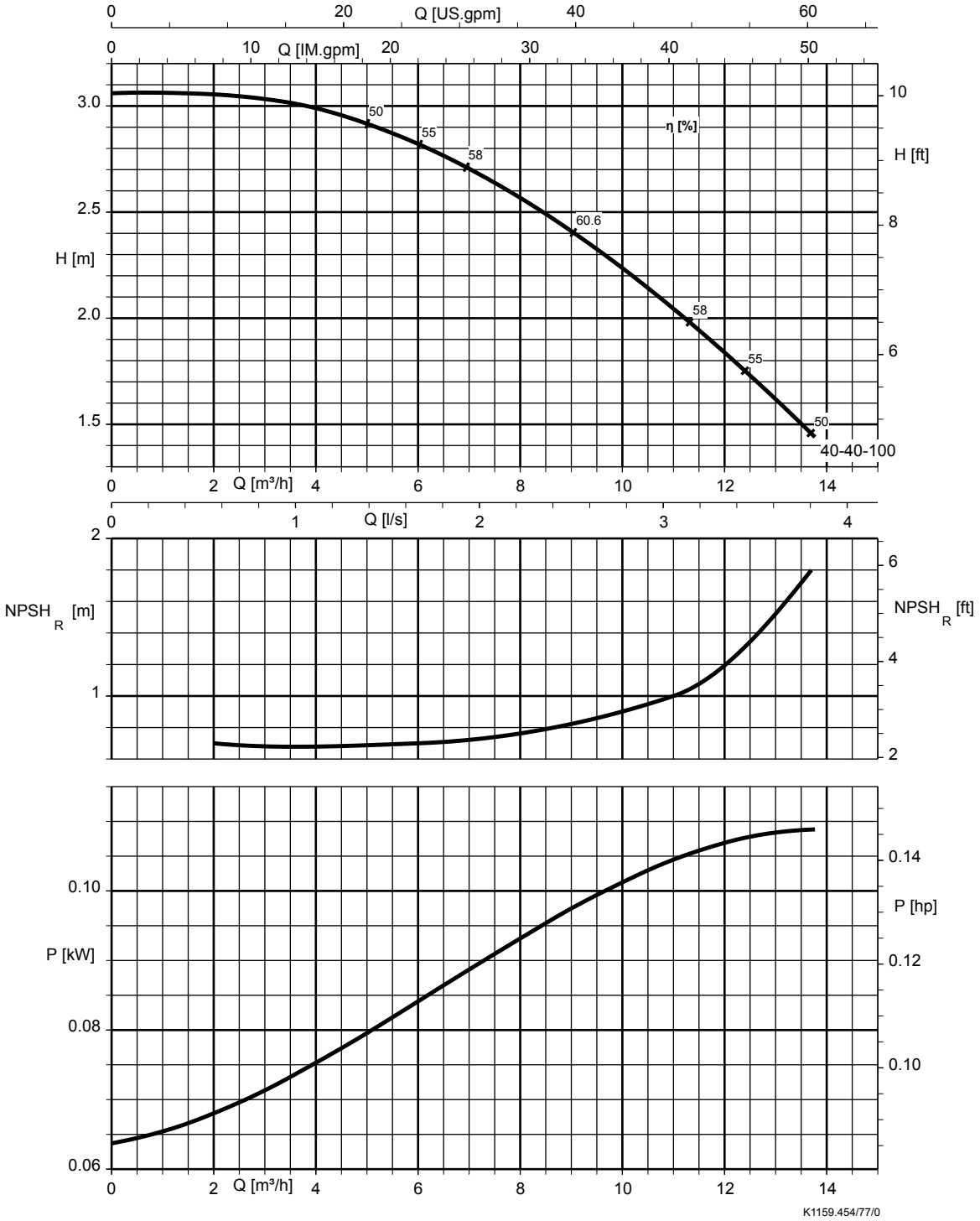


Omega DSL, n = 1450 rpm

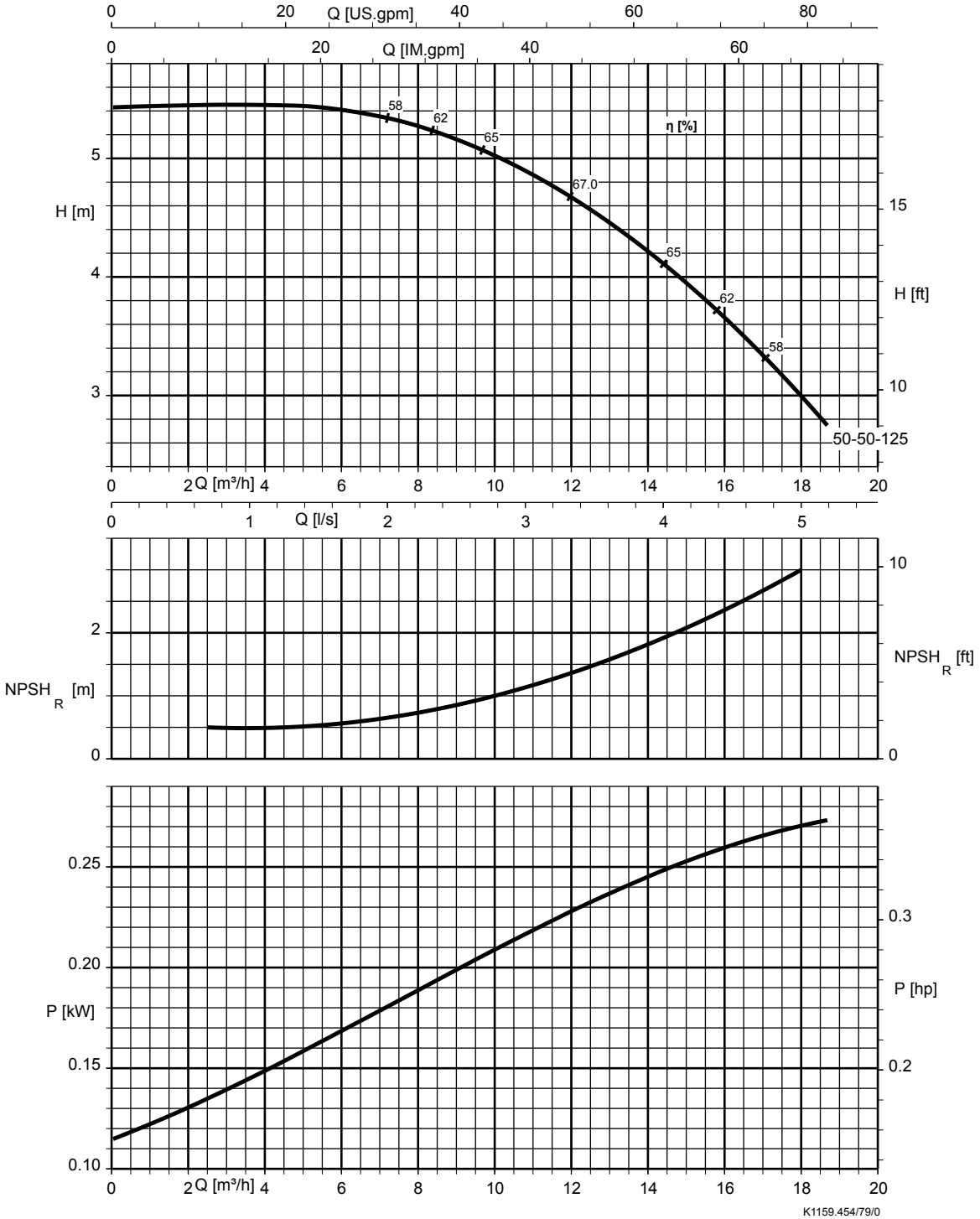
Omega DSL 32-32-125, n = 1450 rpm



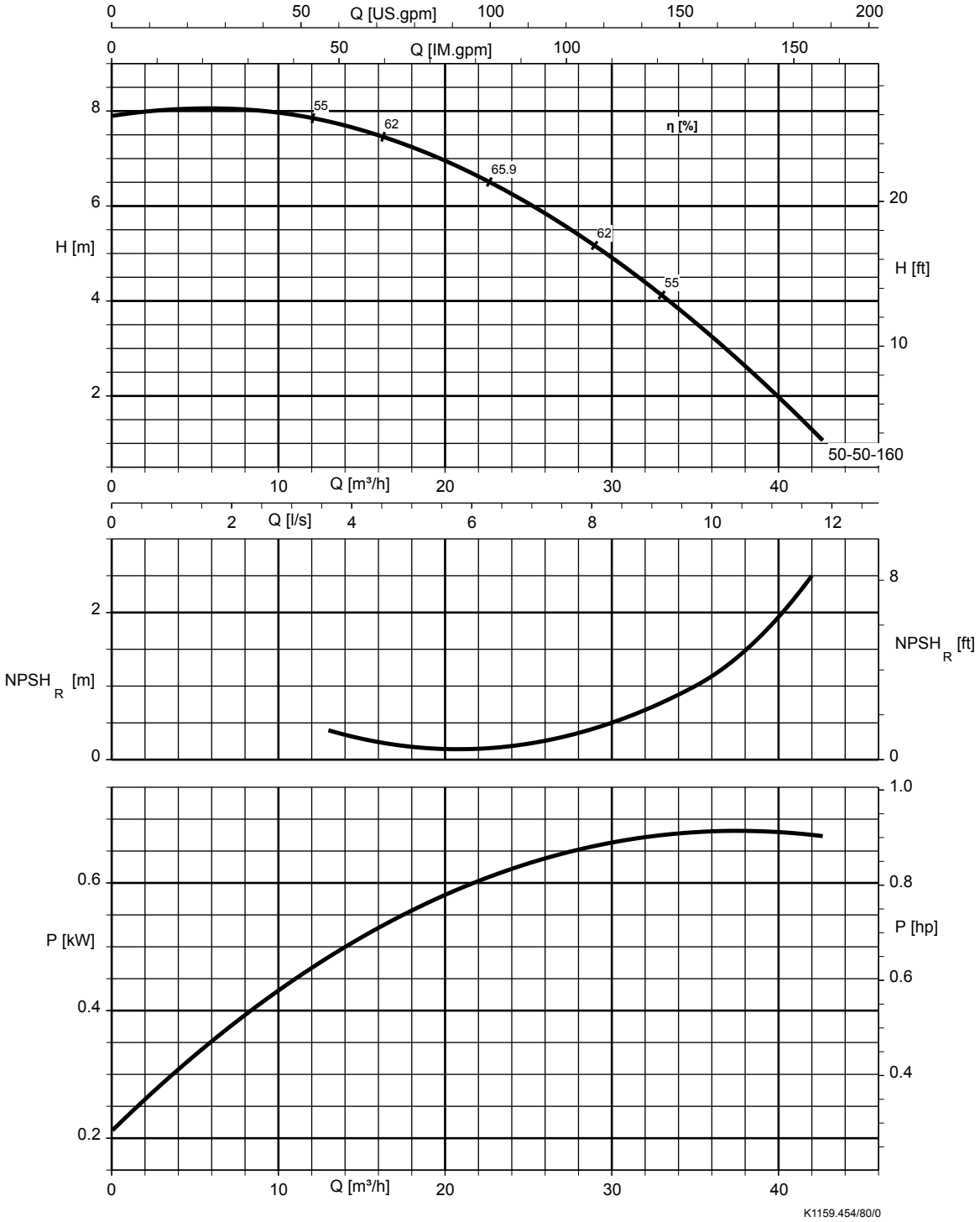
Omega DSL 40-40-100, n = 1450 rpm



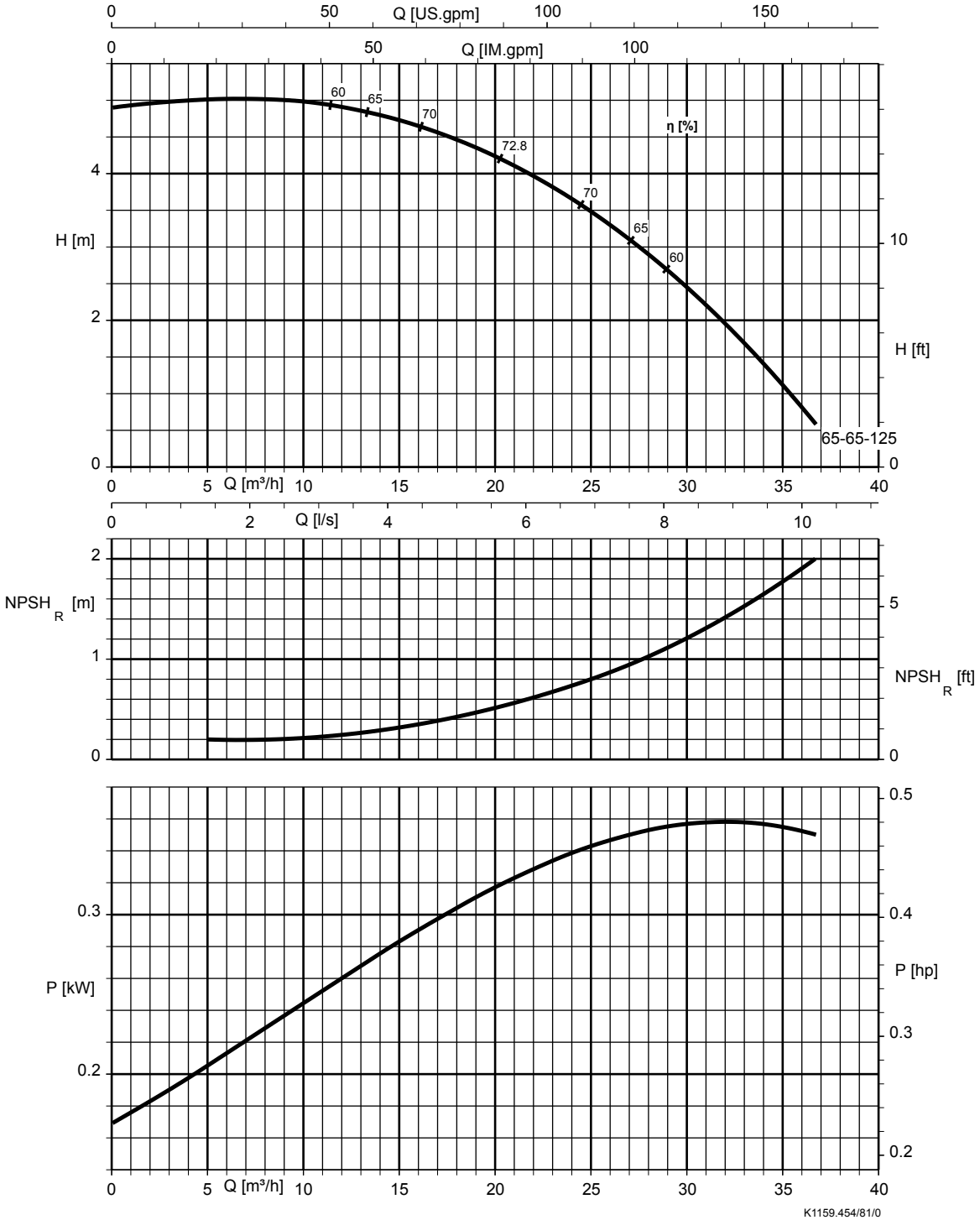
Omega DSL 50-50-125, n = 1450 rpm



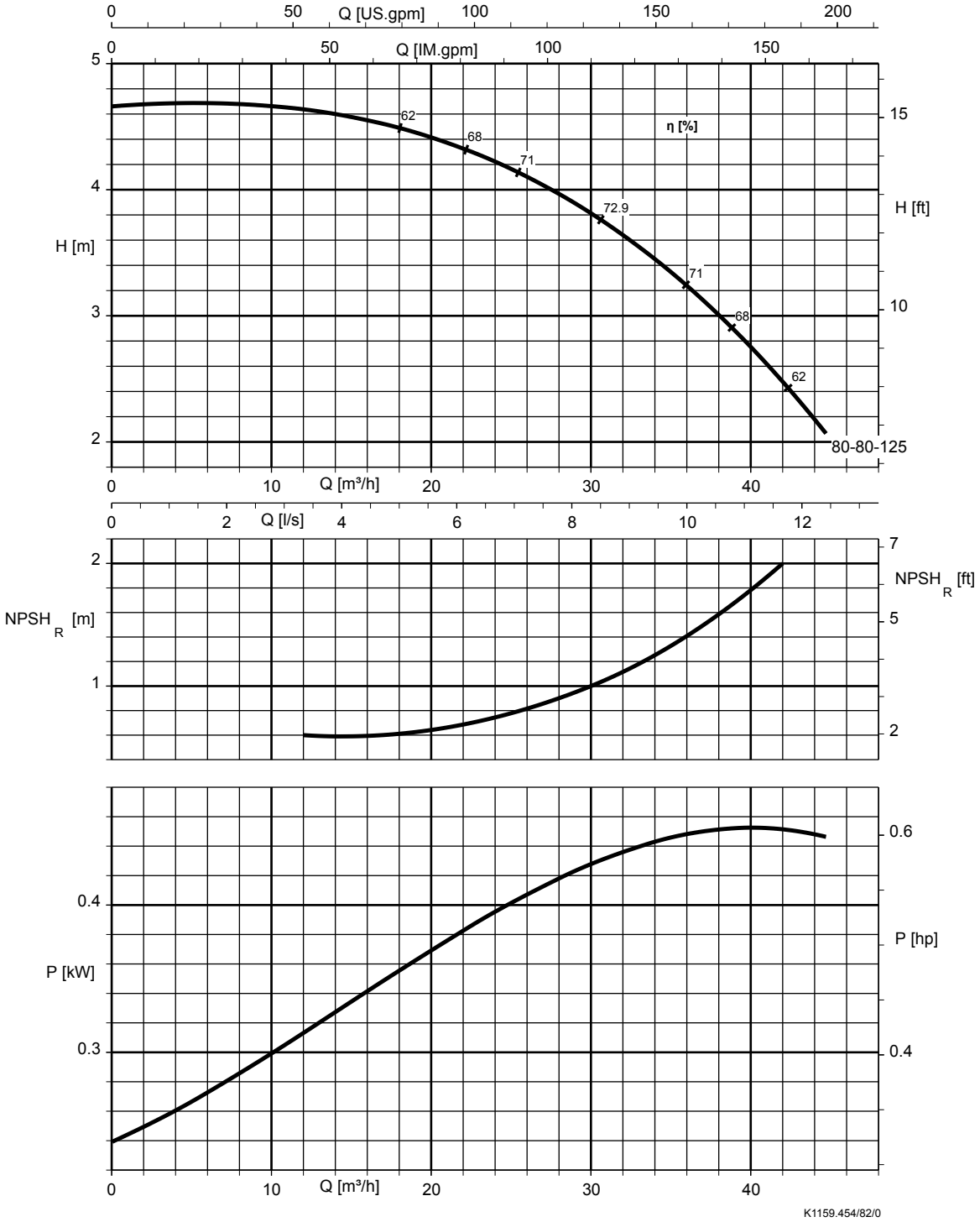
Omega DSL 50-50-160, n = 1450 rpm



Omega DSL 65-65-125, n = 1450 rpm



Omega DSL 80-80-125, n = 1450 rpm



Dimensions and connections

Connections

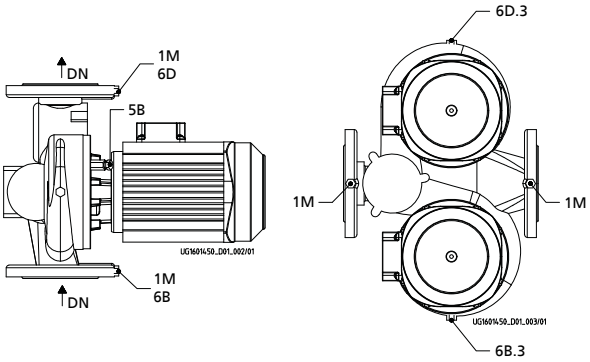


Fig. 1: Horizontal installation

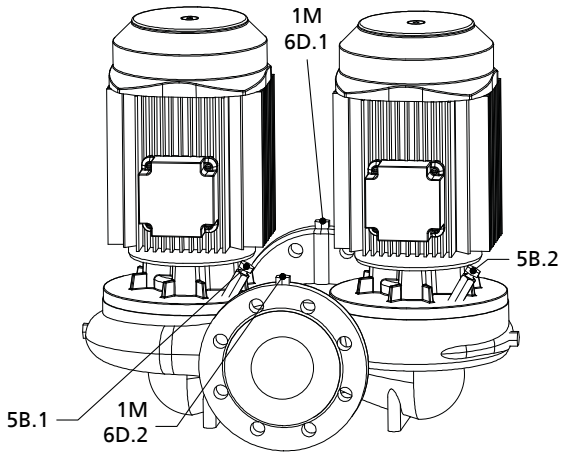


Fig. 2: Vertical installation

Connection types

Connection	Description	Configuration	Position
1M	Pressure gauge connection	Drilled and closed, or pressure sensor for PumpMeter (if selected)	Suction flange and discharge flange
5B, 5B.1, 5B.2	Vent connection for the mechanical seal chamber	Plugged with vent plug	Casing cover
6B, 6B.3	Fluid drain	Drilled and closed	Volute casing
6D, 6D1, 6D.2, 6D.3	Fluid priming and venting	Drilled and closed	Volute casing

Connection

Size	1M, 6B, 6D, 6D.1, 6D.2	6B.3, 6D.3
032-032-80	-	-
032-032-100	G ¼	G ⅛
032-032-105	G ¼	G ⅛
032-032-125	G ¼	G ⅛
040-040-60	G ¼	G ⅛
040-040-90	G ¼	G ⅛
040-040-100	G ¼	G ⅛
050-050-110	G ¼	G ⅛
050-050-125	G ¼	G ⅛
050-050-160	G ¼	G ⅛
065-065-100	G ¼	G ⅛
065-065-115	G ¼	G ⅛
065-065-125	G ¼	G ⅛
080-080-105	G ¼	G ⅛
080-080-115	G ¼	G ⅛
080-080-125	G ¼	G ⅛

Pump set dimensions

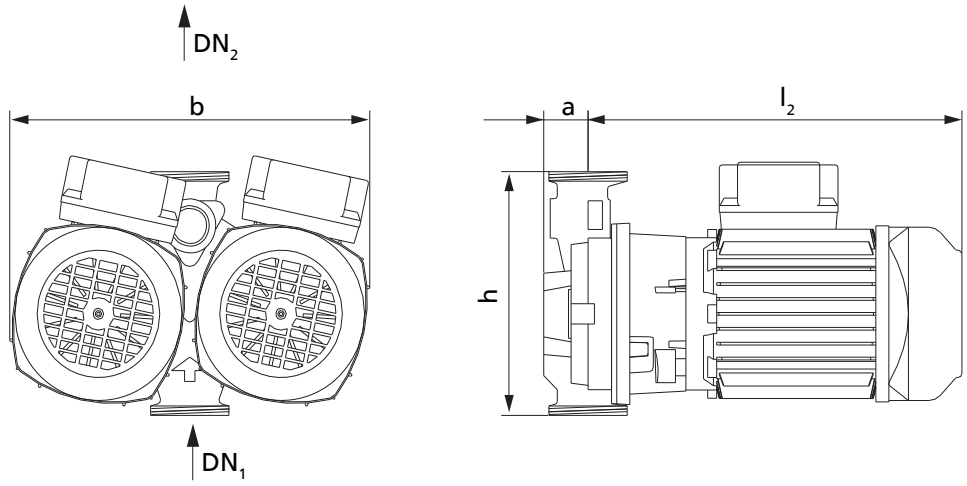


Fig. 3: Dimensions of screw-ended pump set, size 032-032-080

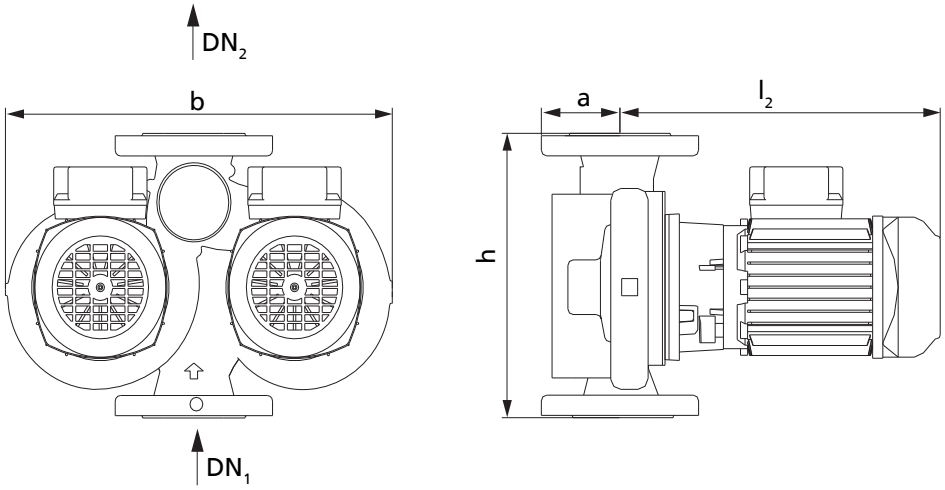


Fig. 4: Dimensions of flanged pump set, size 032-032-100

Dimensions, n = 2900 rpm

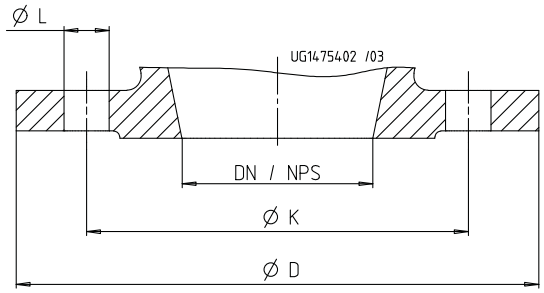
Size	Motor	DN	Connection Thread	a	h	b	l_2
	[kW]	[mm]		[mm]	[mm]	[mm]	[mm]
032-032-080	0,25	32	G 2	34	180	276	266
032-032-100	0,25	32	-	70	220	352	284
032-032-105	0,55	32	-	70	260	378	304
032-032-125	0,75	32	-	70	260	378	304
040-040-060	0,25	40	-	70	250	350	275
040-040-090	0,55	40	-	75	250	430	295
040-040-100	0,75	40	-	75	250	430	315
050-050-110	1,1	50	-	85	280	405	325
050-050-125	1,8	50	-	85	280	405	355
065-065-100	1,1	65	-	95	340	492	340
065-065-115	1,8	65	-	95	340	492	370
065-065-125	3	65	-	95	340	492	385
080-080-105	1,1	80	-	105	360	520	325
080-080-115	1,8	80	-	105	360	520	360
080-080-125	3	80	-	105	360	520	380

Dimensions, n = 1450 rpm

Size	Motor	DN	Connection Thread	a	h	b	l_2
	[kW]	[mm]		[mm]	[mm]	[mm]	[mm]
032-032-125	0,12	32	-	70	260	378	304
040-040-100	0,12	40	-	75	250	430	295
050-050-125	0,18	50	-	85	280	405	280
050-050-160	0,75	50	-	87	340	492	355
065-065-125	0,37	65	-	95	340	429	291
080-080-125	0,37	80	-	105	360	520	275

Flange dimensions

Fig. 5: Flange dimensions



Flange dimensions [mm]

DN / NPS	Standard							Note
	EN 1092-2						DIN EN ISO 228-1	
	Material							
	G, B							
	PN 10			PN 6			Thread	
	Ø K	Ø D	Number of holes L	Ø K	Ø D	Number of holes L		
32 / NPS11/4	100	140	4×∅19	90	140	4×∅14	G 2[6]	Adapter flange PN6/ PN10
40 / NPS11/2	110	150	4×∅19	100	150	4×∅14	-	
50 / NPS2	125	165	4×∅19	110	165	4×∅14	-	
65 / NPS21/2	145	185	4×∅19	130	185	4×∅14	-	
80 / NPS3	160	200	8×∅19	-	-	-	-	-

[6] For sizes < 032-032-100 only

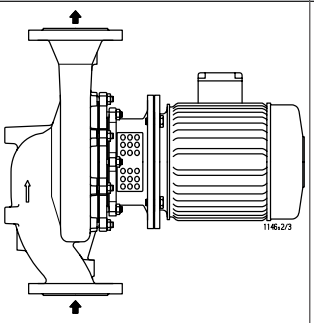
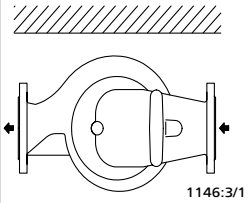
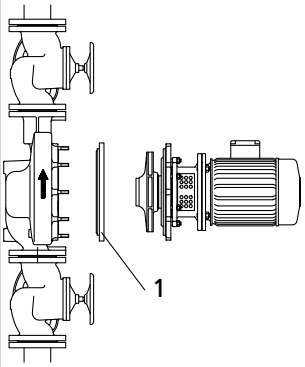
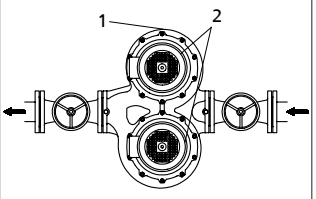
Flange design

Flange design by materials

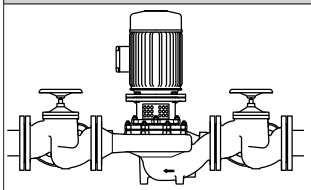
Material variant	Standard	Nominal diameter	Pressure class
GG, GP	DIN EN ISO 228-1	032-032-080	PN 10
	Drilled to EN 1092-2	DN 32 - DN 65	PN 6 / PN 10
	Drilled to EN 1092-2	DN 80	PN 10

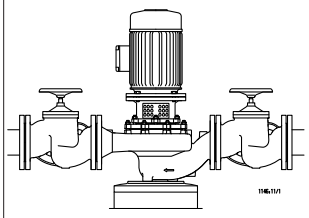
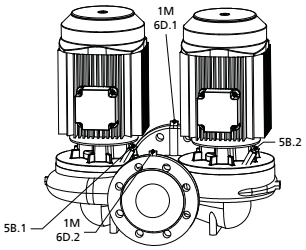
Typical installation positions

Horizontal installation

Example drawing	Special aspects
 Direction of flow from bottom to top	**Direction of flow from bottom to top**
 Horizontal installation	**Horizontal installation (for example under the ceiling)** The volute casing and/or back pull-out unit must be turned by 90° so that the terminal box remains in its current position on top.
 Installation with blind flange	**1 = Blind flange (accessories)** If one of the pumps needs to be serviced, the pump chamber can be shut off by a blind flange so that the system remains operational.
 Horizontal piping	1 = Screw plug 6D.3 and 2 = Valve 5B, 5B.1, 5B.2 If the piping is laid horizontally, vent the upper pump through upper screw plug 6D.3 and vent valve 5B, 5B.1, 5B.2. This will ensure trouble-free operation.

Vertical installation

Example drawing	Special aspects
 Vertical installation without feet	**Mounted without feet** Installed directly in the piping. Always anchor the pipes in close proximity to the pump in this case.

Example drawing	Special aspects
 Vertical installation with pump foot	**Mounted on pump foot (accessory)** Available upon request.
	The mechanical seal chambers can be vented through vent valves 5B.1 and 5B.2.

General drawing with list of components

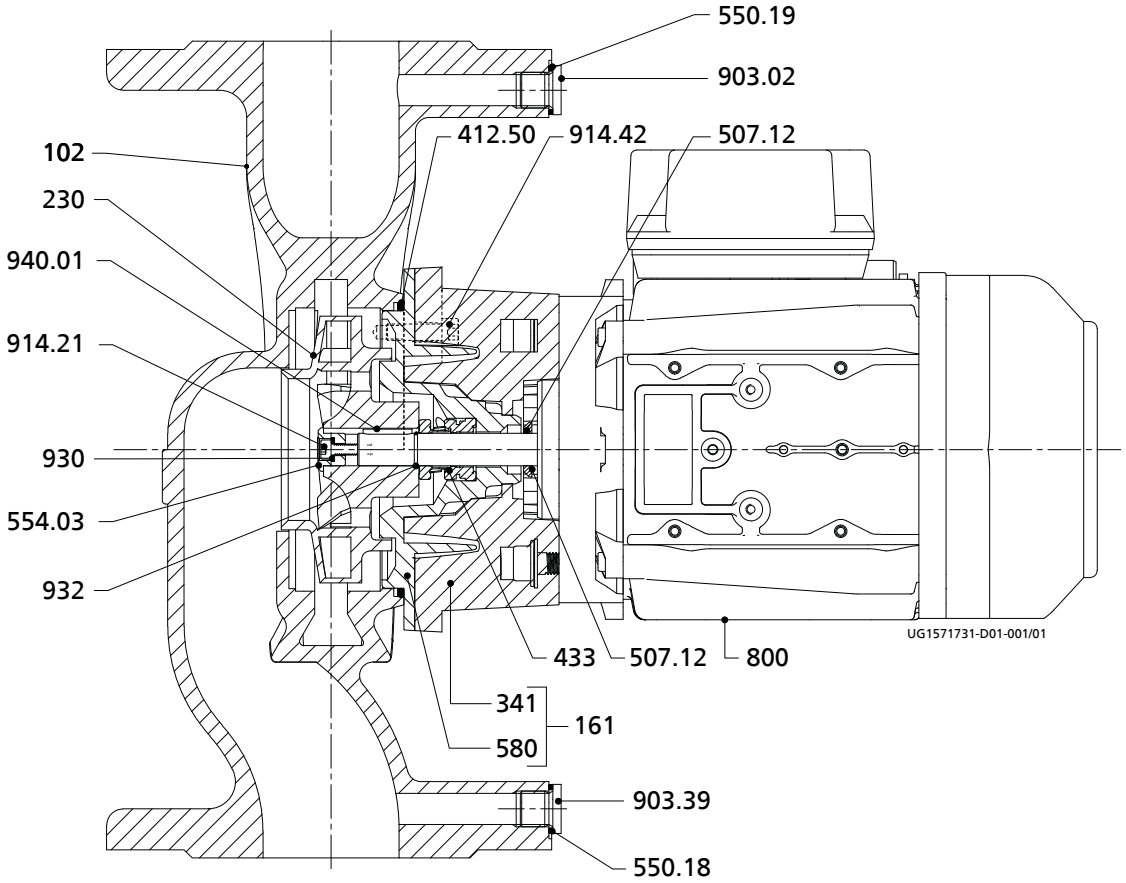


Fig. 6: General assembly drawing

List of components

Part No.	Description	Part No.	Description
102	Volute casing	554.03	Washer
161	Casing cover	580	Cap
230	Impeller	800	Motor
341	Drive lantern	903.02/.39	Screw plug
412.50	O-ring	914.21/.42	Hexagon socket head cap screw
433	Mechanical seal	930	Safety device
507.12	Thrower	932	Circlip
550.18/.19	Disc	940.01	Key

The following spare parts kits are available:

Spare parts kits	Part No.	Description
Casing	102	Volute casing
	412	O-ring
Impeller	230	Impeller
Shaft seal	433	Mechanical seal
	932	Circlip
Motor	970	Label/plate
	563	Bolt/stud
	900	Screw
	950	Spring
	161	Casing cover
	801	Flanged motor
	433	Mechanical seal
	412	O-ring
	507	Thrower
	932	Circlip
	940	Key
	554	Washer
	914	Hexagon socket head cap screw
	930	Safety device

Detailed designation

Designation example

Position																																											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
E	T	L	L	0	2	5	-	0	2	5	-	0	6	3	-	G	G	-	A	V	1	1	D	2	0	0	1	2	2	C		A	A	T	B	I	E	3	P	D	2		
See name plate and data sheet																						See data sheet																					

Designation key

Position		Code	Description
1-4	Pump type		
		OMSL	Omega SL
		OMDL	Omega DSL
5-16	Size		
		025	Nominal suction nozzle diameter [mm]
		025	Nominal discharge nozzle diameter [mm]
		063	Nominal impeller diameter [mm]
17	Pump casing material		
		G	EN-GJL-200 / EN-GJL-250
		B	CC491K
18	Impeller material		
		G	EN-GJL-150
		B	G-CuSn10Zn
		P	PSU-GF30
19	Design		
		X	Special design BT3D, BT3
		P	Model with casing cover made of polysulphone
		W	WRAS-approved for drinking water
20	Casing cover		
		A	Conical seal chamber
21	Seal type		
		V	Conical seal chamber
22-23	Seal code		
		11	BQ1EGG
		12 [7)]	BQ1PGG
		13 [7)]	BVPGG
		14 [7)]	Q5Q1EGG
		15 [7)]	Q5Q1PGG
24	Scope of supply		
		D	Pump, baseplate, coupling, coupling guard, motor
25	Shaft unit		
		2	Shaft unit 12
		4	Shaft unit 14
		6	Shaft unit 16
26-29	Motor rating (basis: 50 Hz)		
		0012	0,12 KW
		0018	0,18 KW
		0025	0,25 KW
		0037	0,37 KW
		0055	0,55 KW
		0075	0,75 KW
		0110	1,1 KW
		0180	1,8 KW

Position		Code	Description
		0300	3,0 KW
30	Number of poles		
		2	2 poles
		4	4 poles
31	Motor design		
		C	Three-phase AC motor 230 V / 400 V
		M	Single-phase AC motor 230 V
32	Blank		
33	Product generation		
		A	Product generation Omega SL / Omega DSL
34-36	Motor manufacturer		
		ATB	ATB
37-39	Efficiency class		
		IE1	IE1
		IE2	IE2
		IE3	IE3
		IE4	IE4
40-43	Blank		
44	Blank		

[7] Available upon request.

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