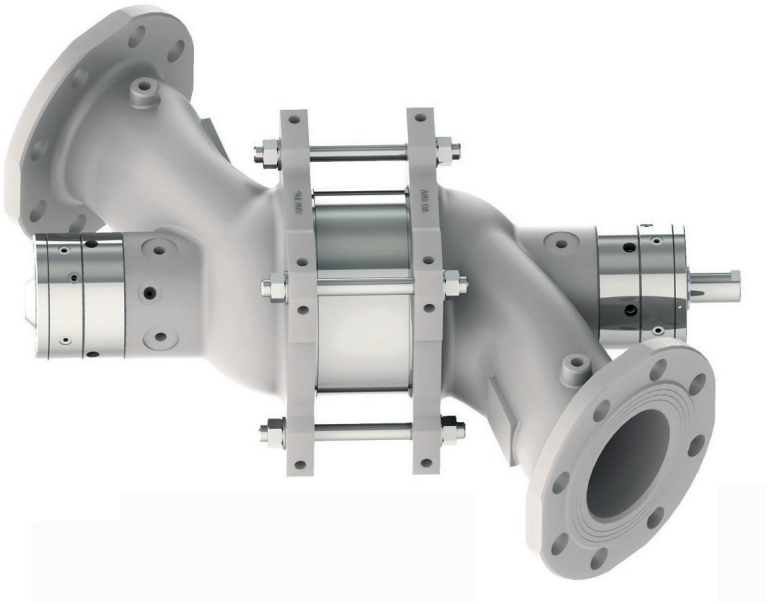
FR LINE - ENERGY PRODUCTION GROUPS TN



The TN energy production groups are the heart of the “FR pressure reduction station with simultaneous production of electricity” by T.I.S. Service S.p.A. and are designed to recover the energy currently lost at the pressure reduction points of aqueducts and irrigation systems.

They are hydraulic production groups, of the axial type with fixed blades, very simple and robust. The flow modulation towards the user, where necessary, is achieved with a special T.I.S. valve, installed immediately downstream of the group. A second regulation valve, installed in parallel to the production group, guarantees the continuity of the flow towards the user downstream.

The particular construction shape, with aligned flanges, allows direct insertion into existing piping sections. It is also possible to rotate the two inlet/outlet sections to obtain various installation configurations by adding simple 45° bends.

The TN production groups have been designed in various standard models, distinguished by flange diameter, from DN50 to DN350, to cover a very wide range of water flow rates with high efficiency and ensure rapid availability of spare parts.

The body of the TN groups can withstand pressures up to PN40, up to the TN200 model. The larger models are normally made PN16 or 25. The TN groups can work with a head (difference between the inlet and outlet pressure) of up to 80 mH2O.

The efficiency of the TN groups is on average higher than 70%, at the conditions of maximum nominal flow head (from 65% of the small TN50 to over 82% of the TN350). It is very important to underline that the tests carried out in our laboratories have confirmed that the efficiency of the groups does not change significantly even with flow rates below 50% of the nominal.

Further peculiar characteristics of the TN groups are the absolute absence of overpressure phenomena in the ducts, in any operating condition, and the very low noise level.

MATERIALS

In designing the units, particular attention was paid to the choice of materials in contact with drinking water: following migration tests carried out in the laboratory, the materials used are compliant with the Italian Ministerial Decree 174/2004 and can therefore be used in fixed systems for the collection, treatment, supply and distribution of water intended for human consumption.

In the TN unit, the flow of water that passes through the inlet section (4) is directed by the fixed distributor (3) towards the blades of the impeller (5) and then to the outlet section (2). The unit axis (6) passes through two sliding type mechanical seals and is supported by two bearings at the ends (1-7). The coupling of the shaft line with the generator (13) can be of the belt/pulley type (8-9-11-12), protected by a special protective casing (10) or direct by means of an elastic joint

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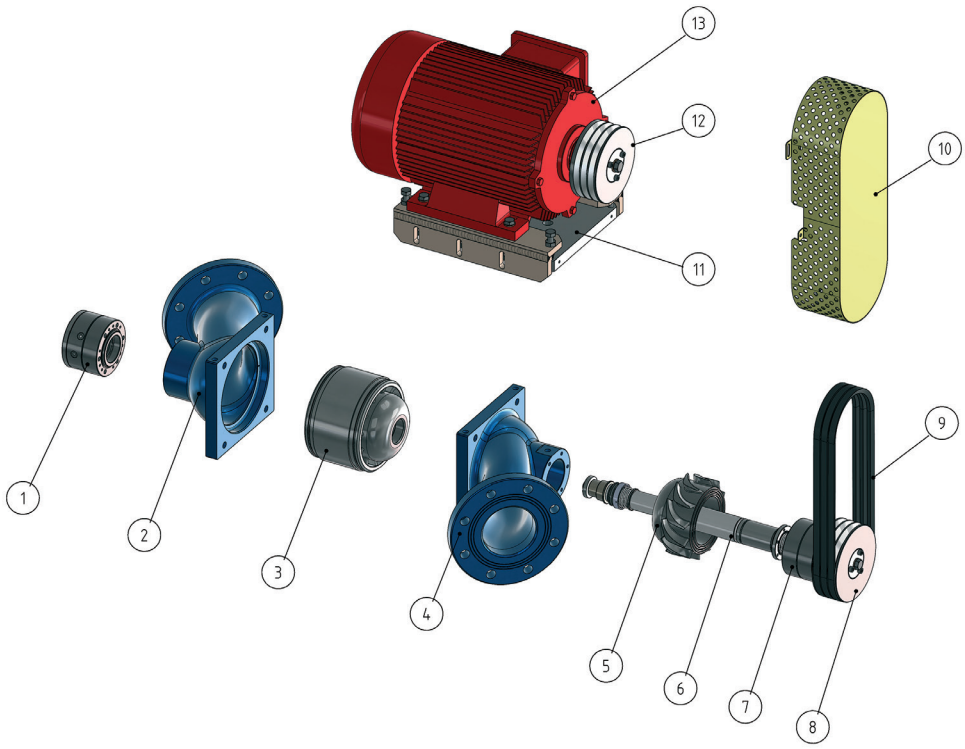
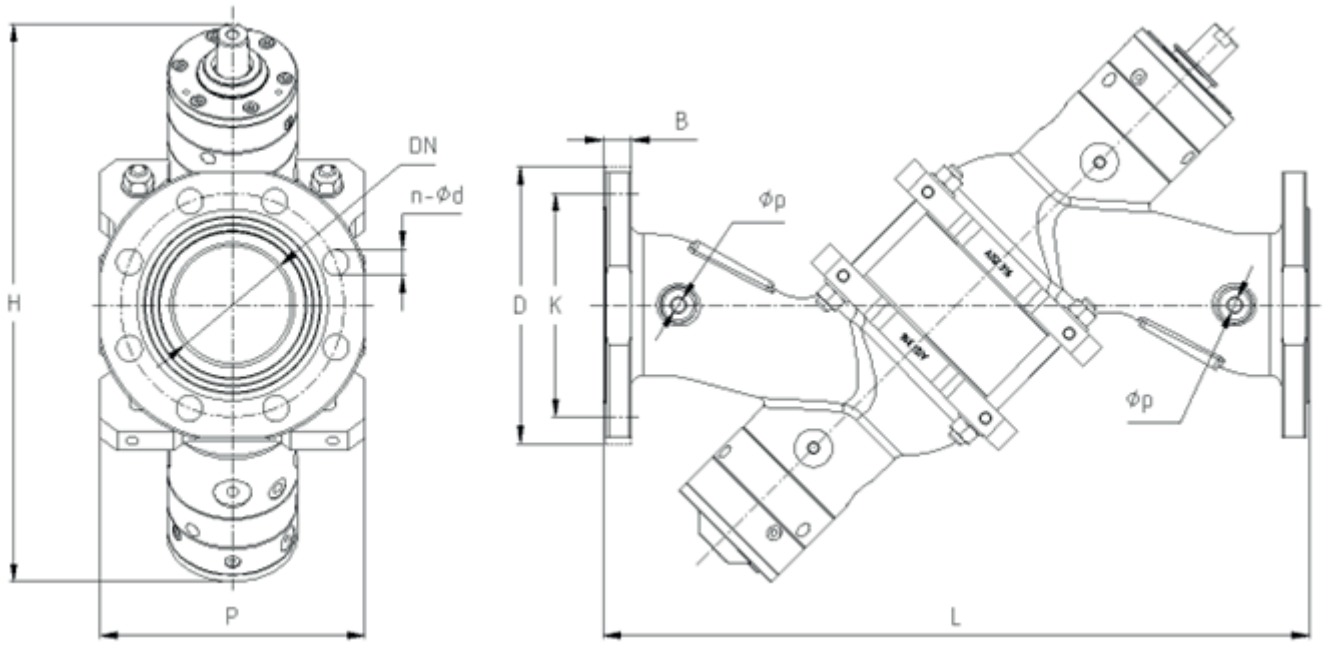


ITEM	COMPONENT	MATERIAL	NOTE
1	Bearing support N.D.E.	AISI316 stainless steel	Grease lubricated ball bearing
2	Output elbow	AISI316 stainless steel	
3	Distributor	1.4313 martensitic stainless steel	
4	Input elbow	AISI316 stainless steel	
5	Runner	1.4313 martensitic stainless steel	
6	Runner shaft	AISI420 martensitic stainless steel	
7	Bearing support D.E.	AISI316 stainless steel	Grease lubricated roller bearing
8	Drive pulley	C45 carbon steel	NITEK nicke-plated
9	Transmission belts		V-belts
10	Protective casing	SR355 JR carbon steel	250 µm epoxy coating
11	Generator frame	SR355 JR carbon steel	NITEK nicke-plated
12	Driven pulley	C45 carbon steel	NITEK nicke-plated
13	Generator		Asynchronous or permanent magnets

DIMENSIONS AND WEIGHTS



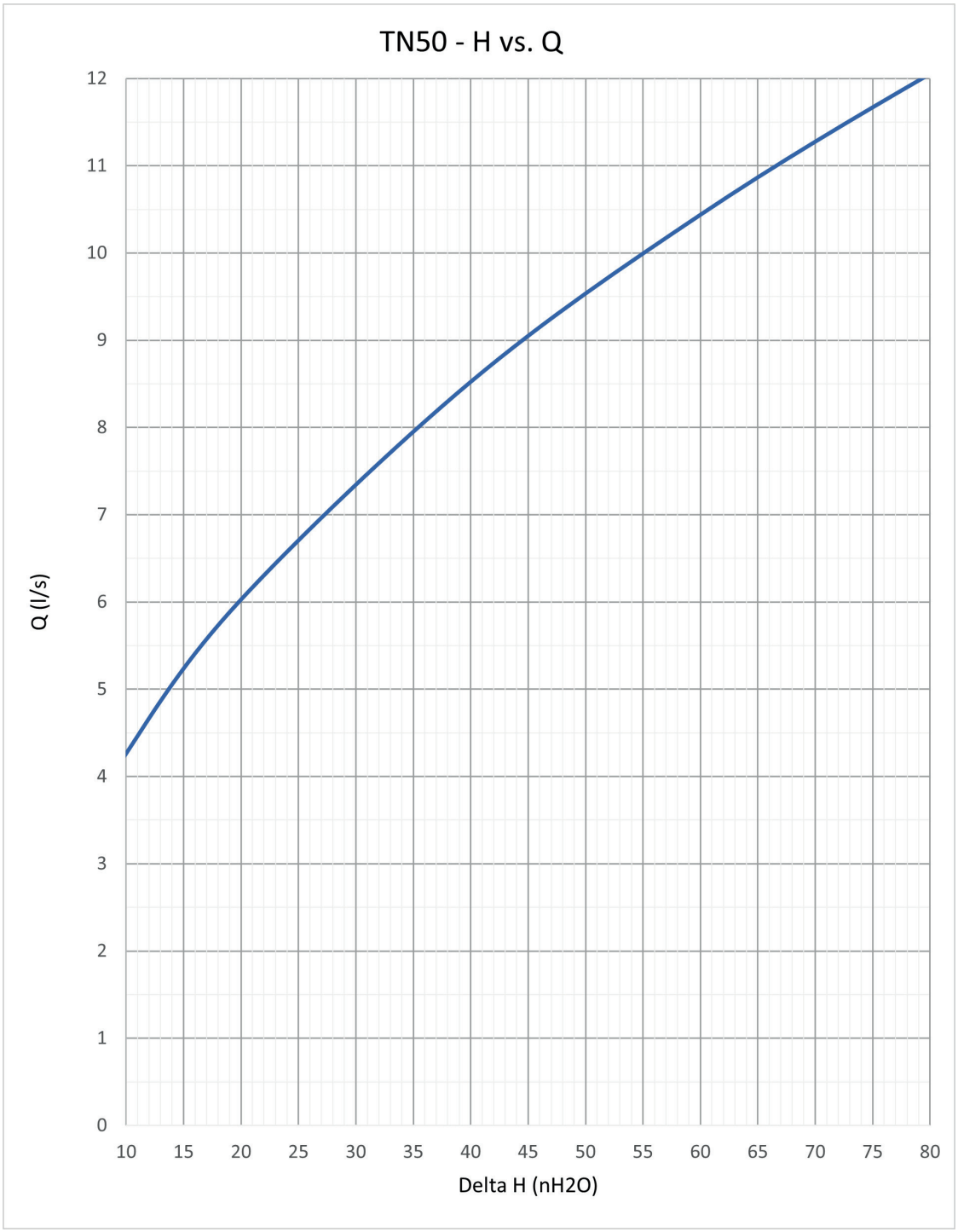
PN40 **PN16/25**

TN	U.M.	50	65	80	90	100	125	150	180	200	250	300	350
DN		50	65	80	100	100	125	150	200	200	250	300	350
D	mm	165	185	200	235	235	270	300	375	375	405	460	520
B	mm	20	22	24	24	24	26	28	34	34	26	28	30
K	mm	125	145	160	190	190	220	250	320	320	355	410	470
n	nr	4	8	8	8	8	8	8	12	12	12	12	16
Ød	m	18	18	18	22	22	26	26	30	30	26	26	26
L	mm	550	560	480	550	600	750	900	1100	1200	1500*	1800*	2100*
P	mm	173	176	180	203	225	282	338	405	450	563*	675*	788*
H	mm	380	400	420	450	480	565	670	760	820	980*	1100*	1250*
W	Kg	40	45	50	70	80	135	220	365	470	900*	1500*	2200*
Øp		G1/8”	G1/8”	G1/4”	G1/4”	G1/4”	G1/4”	G3/8”	G3/8”	G3/8”	G3/8”	G3/8”	G3/8”

*Preliminary dimensions and weights

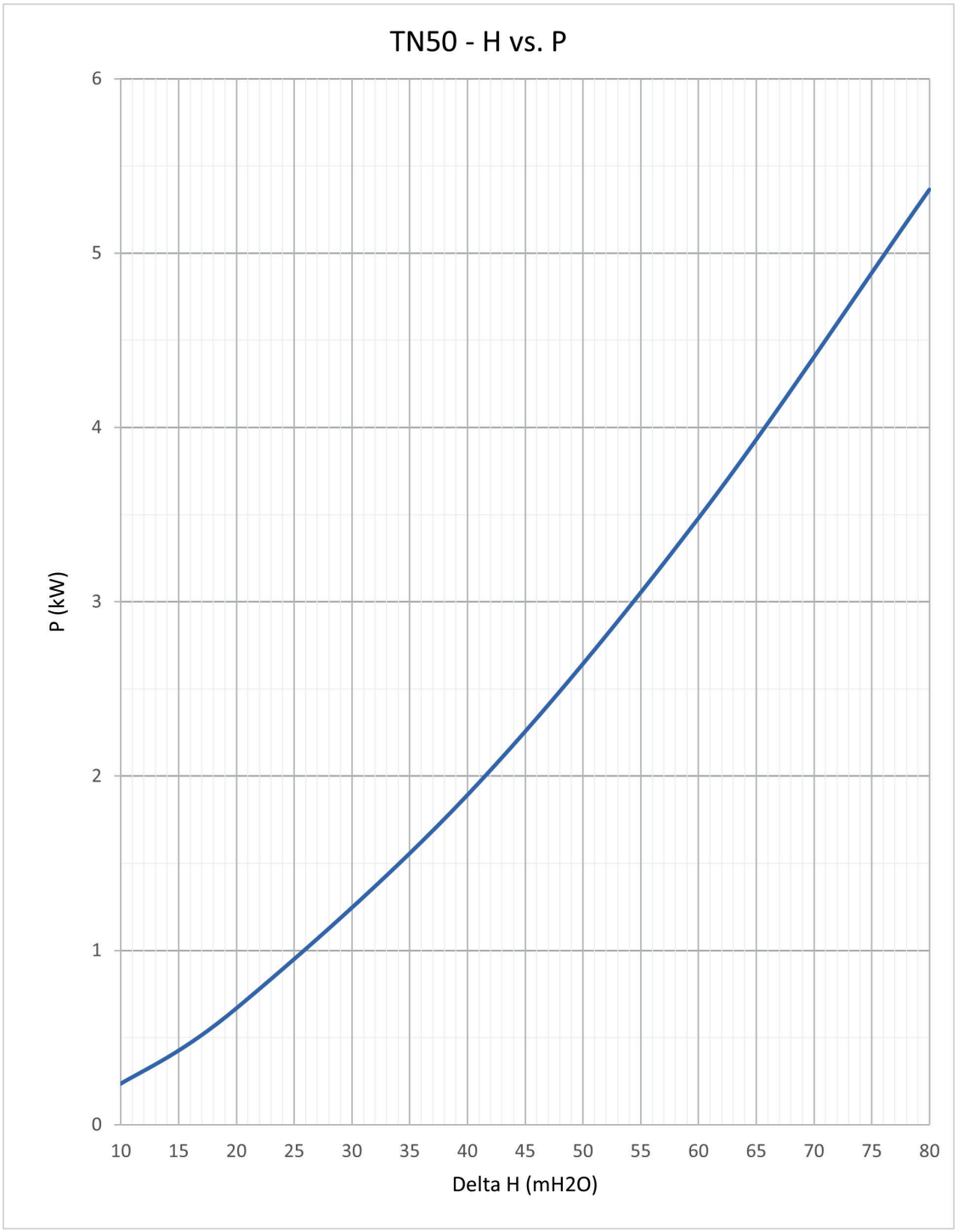
TN50 GROUP

DELTA H VS. FLOW



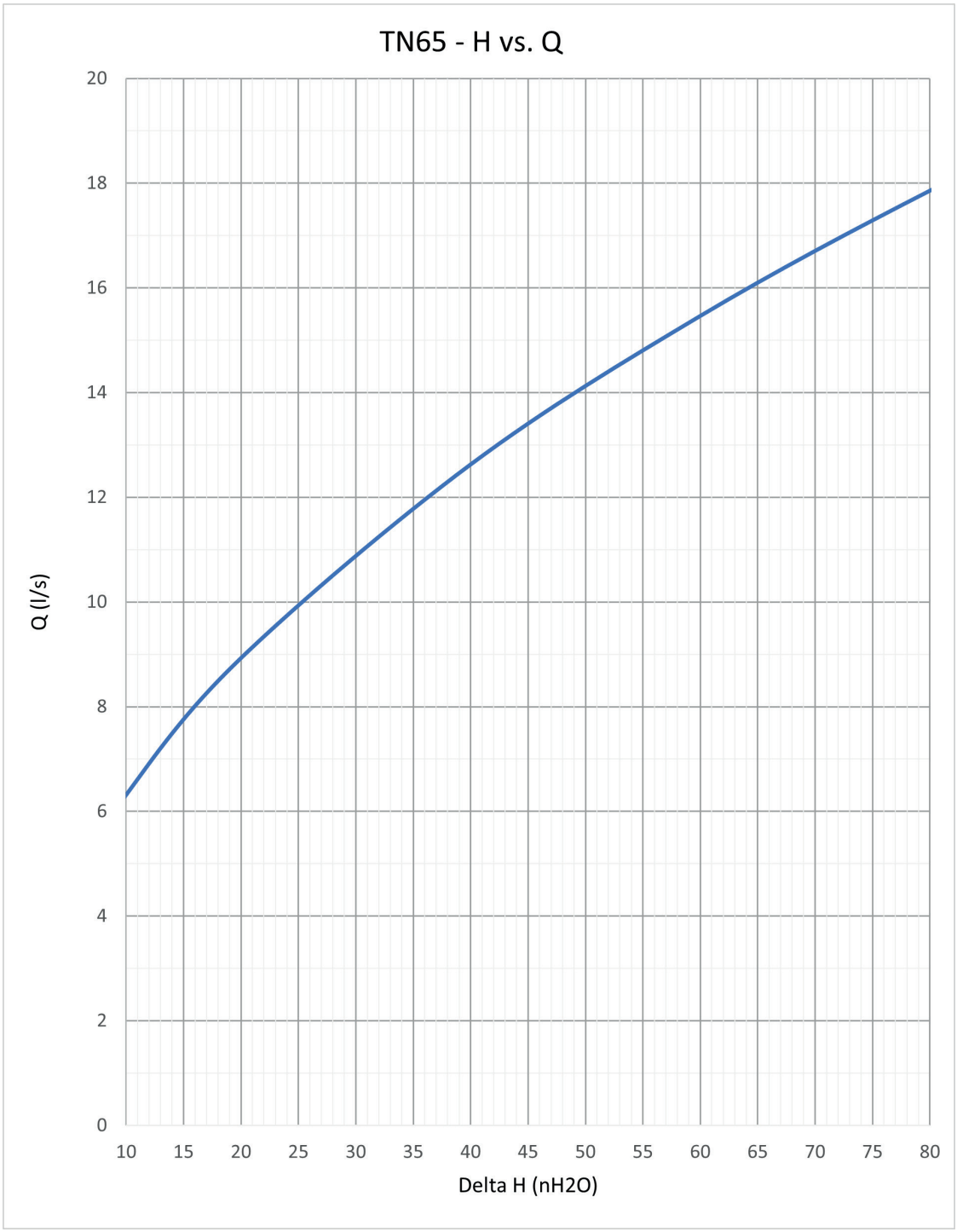
TN50 GROUP

DELTA H VS. PRODUCED POWER



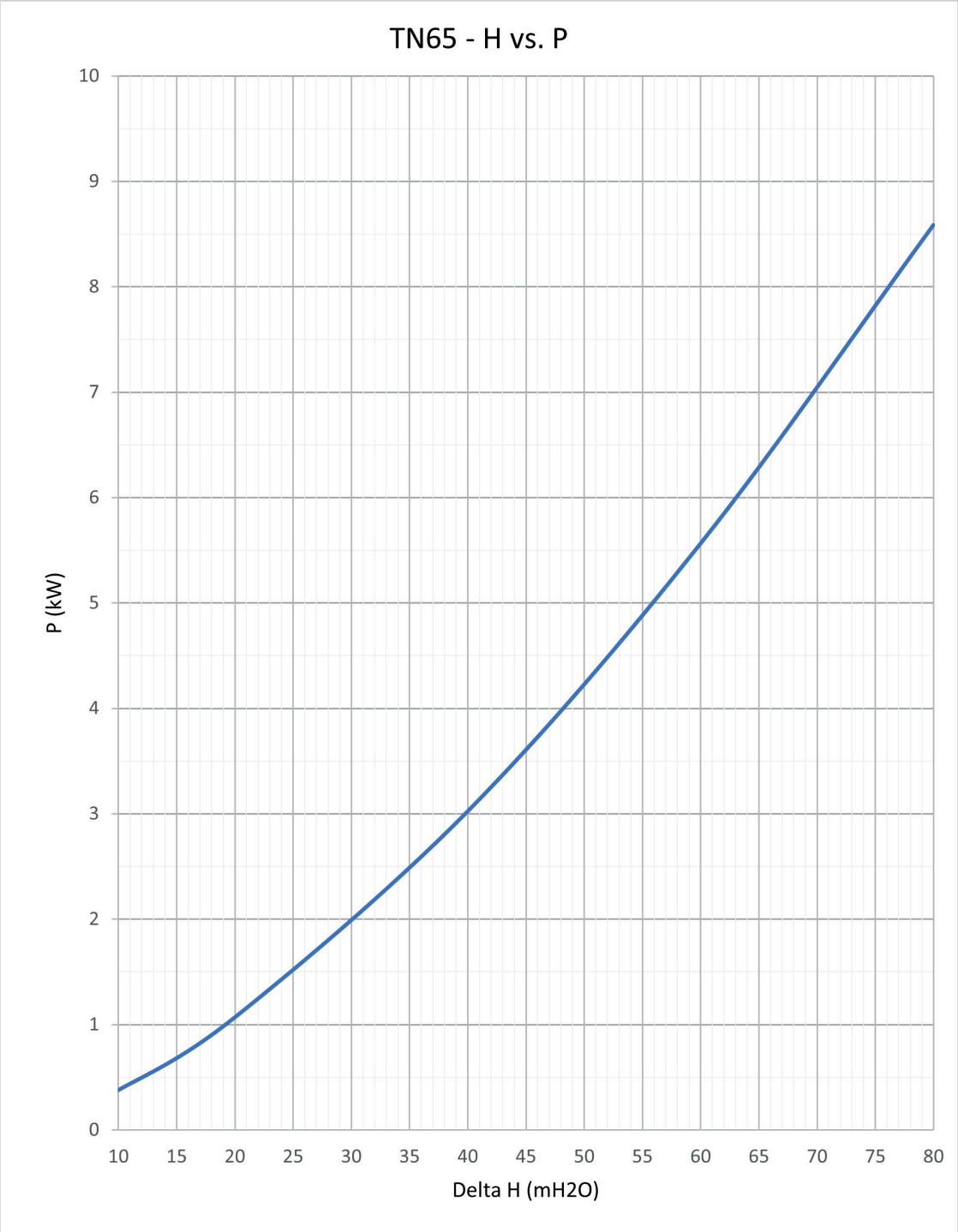
TN65 GROUP

DELTA H VS. FLOW



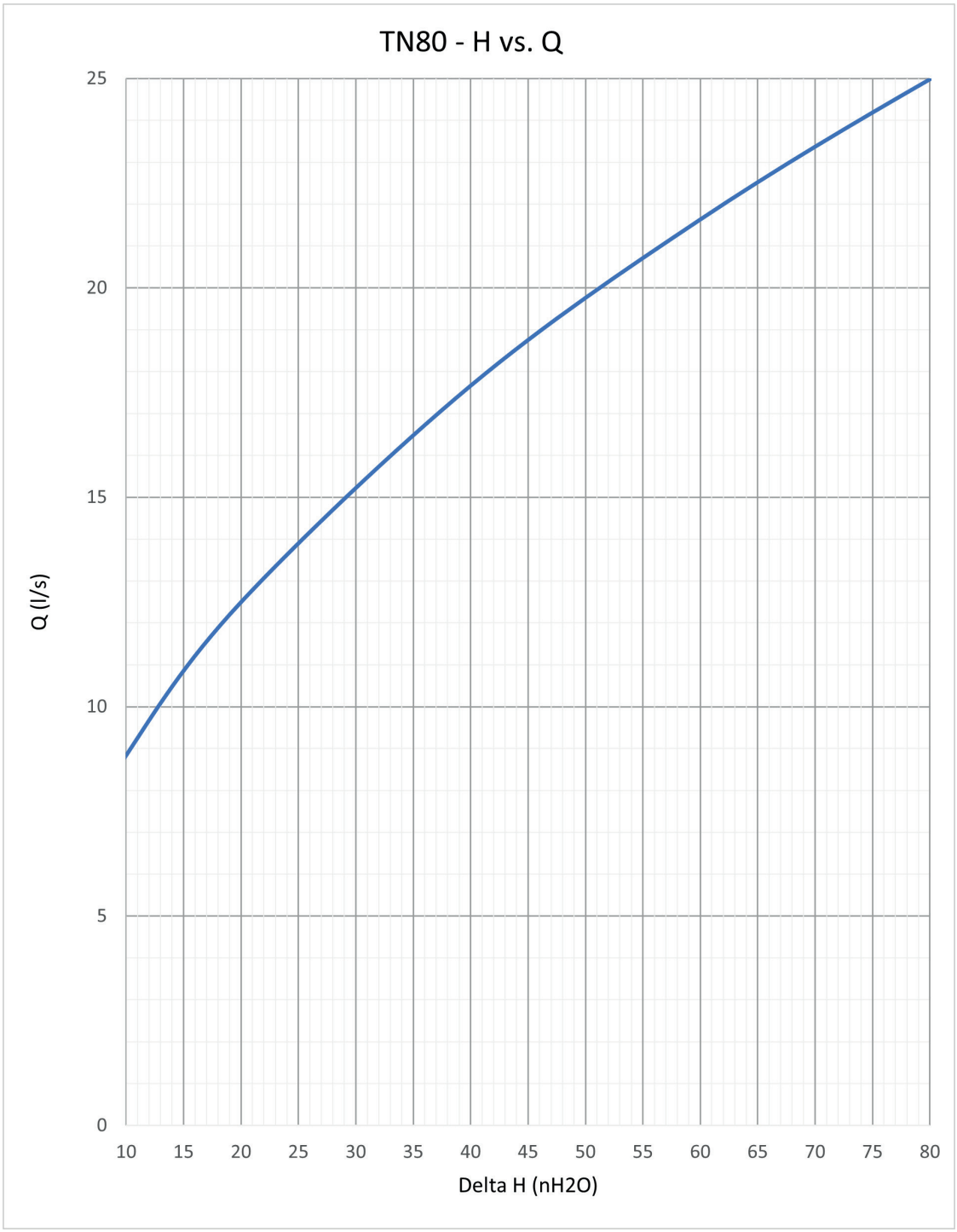
TN65 GROUP

DELTA H VS. PRODUCED POWER



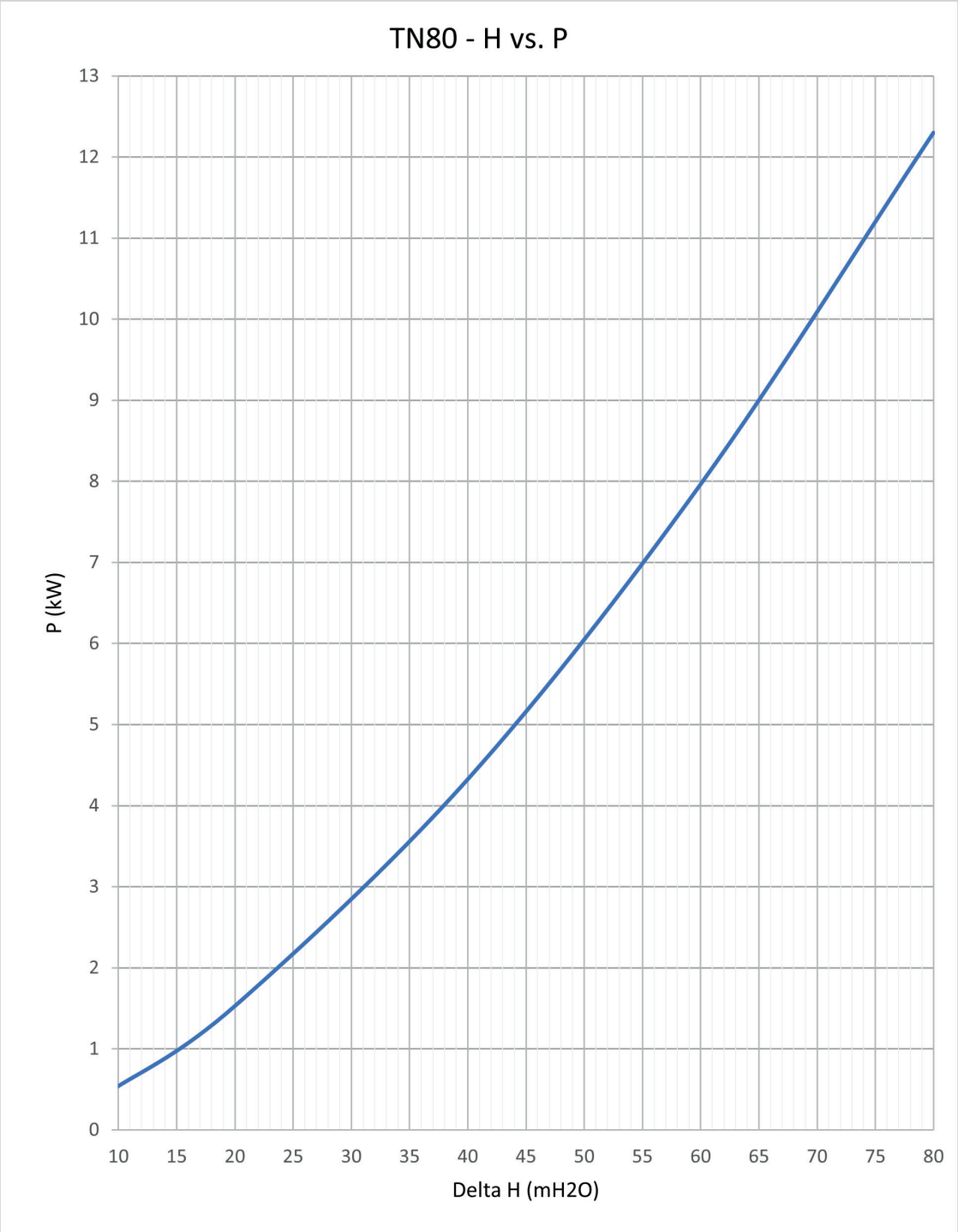
TN80 GROUP

DELTA H VS. FLOW



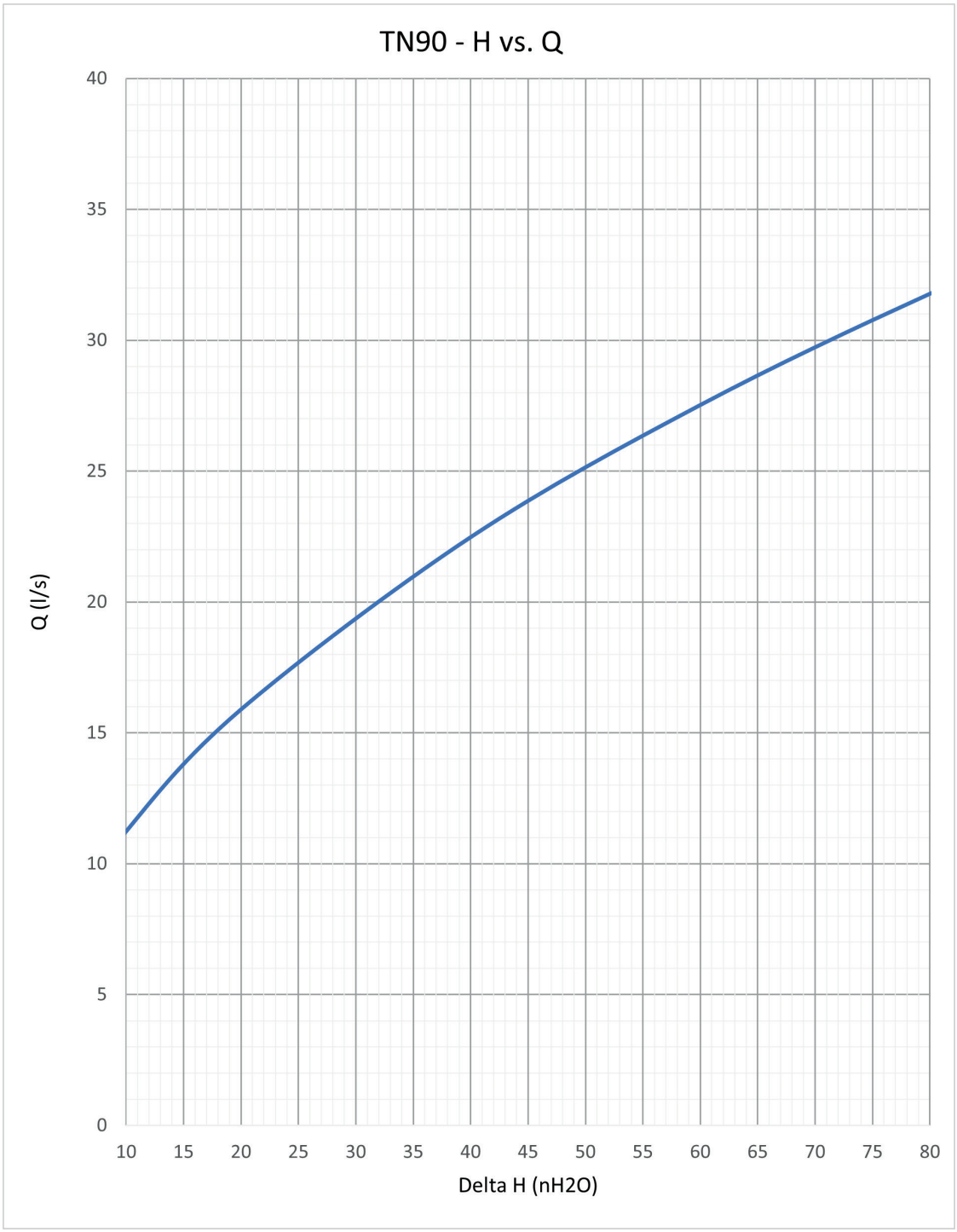
TN80 GROUP

DELTA H VS. PRODUCED POWER



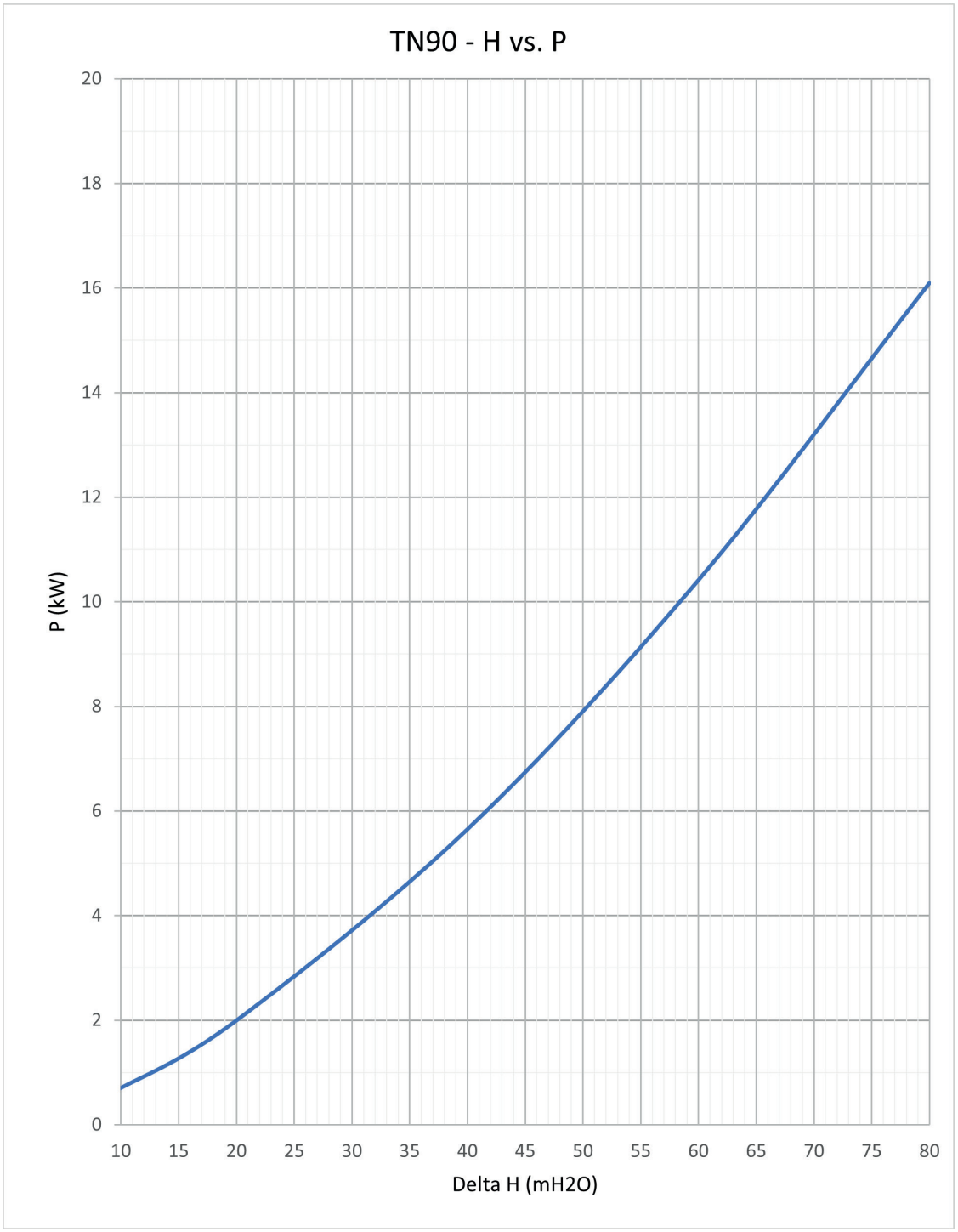
TN90 GROUP

DELTA H VS. FLOW



TN90 GROUP

DELTA H VS. PRODUCED POWER



TN100 GROUP

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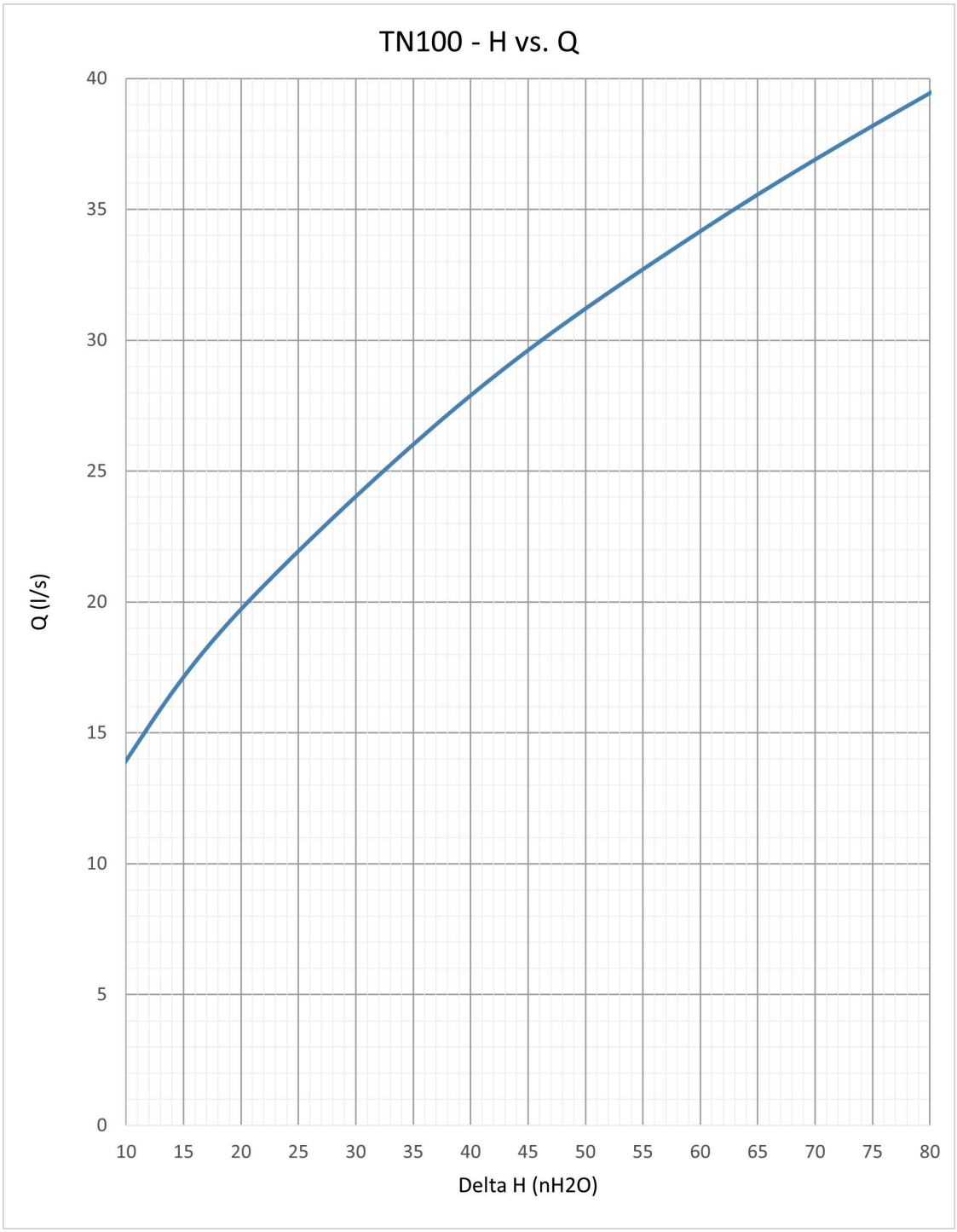
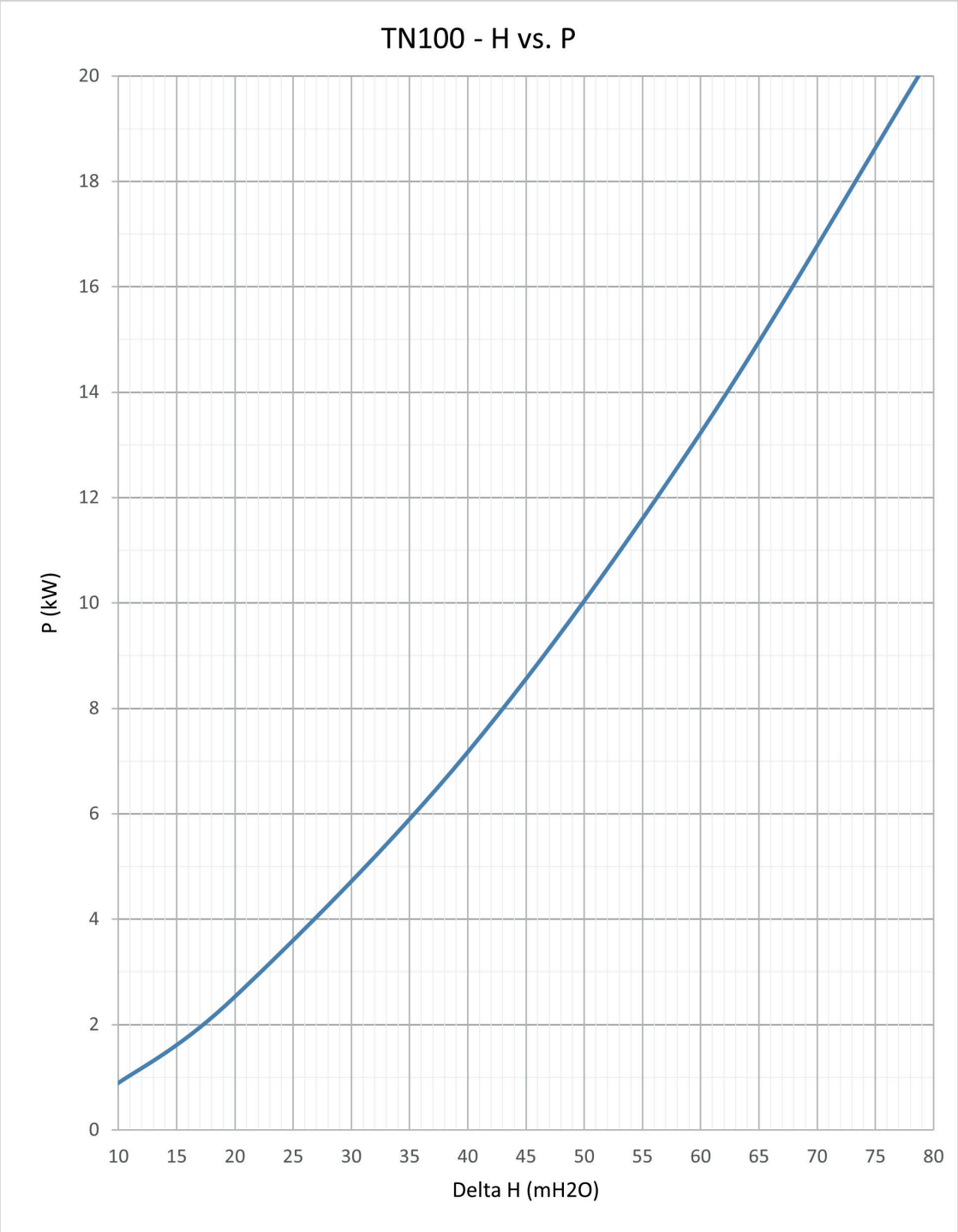


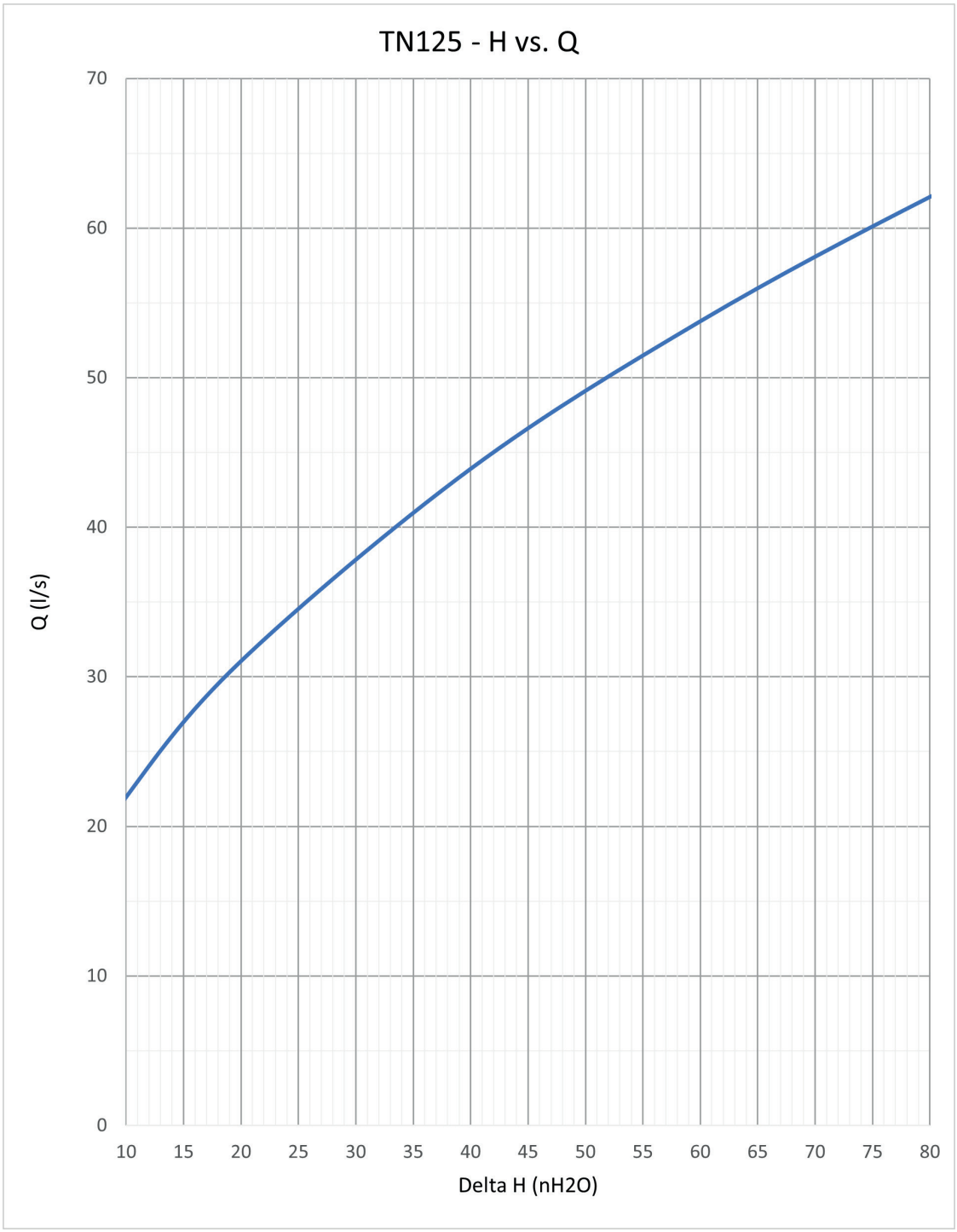
TN100 GROUP

DELTA H VS. PRODUCED POWER



TN125 GROUP

DELTA H VS. FLOW



TN 125 GROUP

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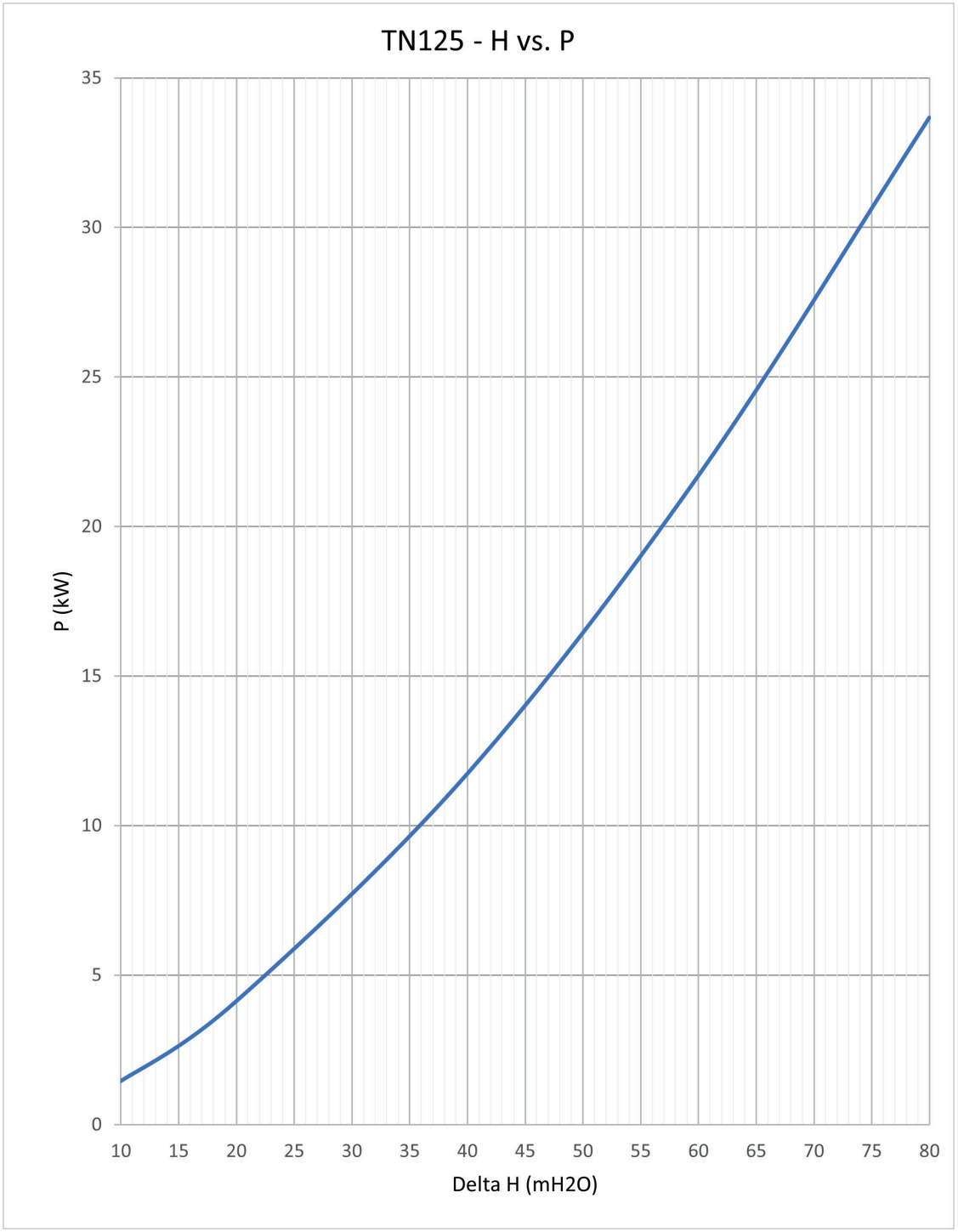
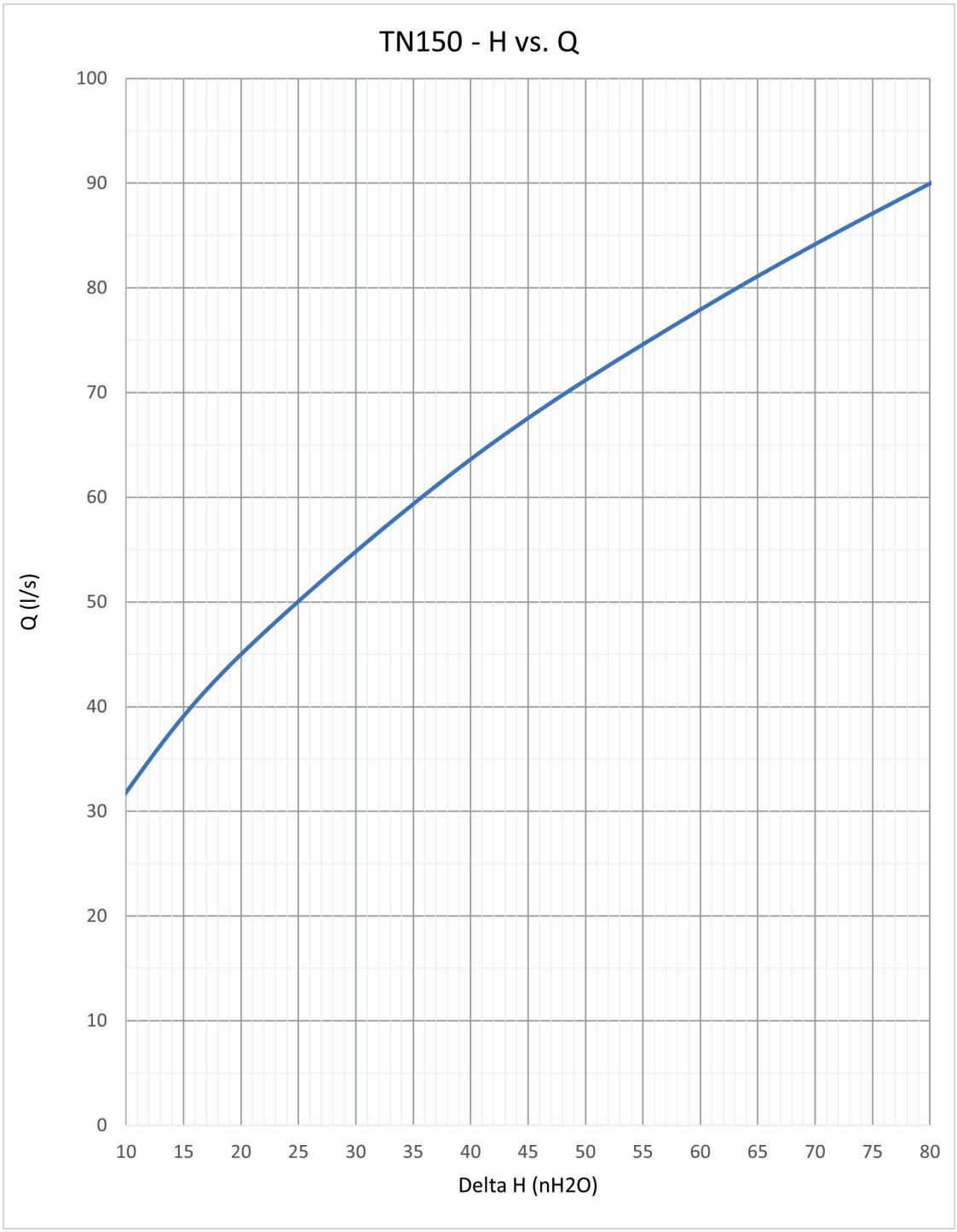


TN 150 GROUP

DELTA H VS. FLOW



TN 150 GROUP

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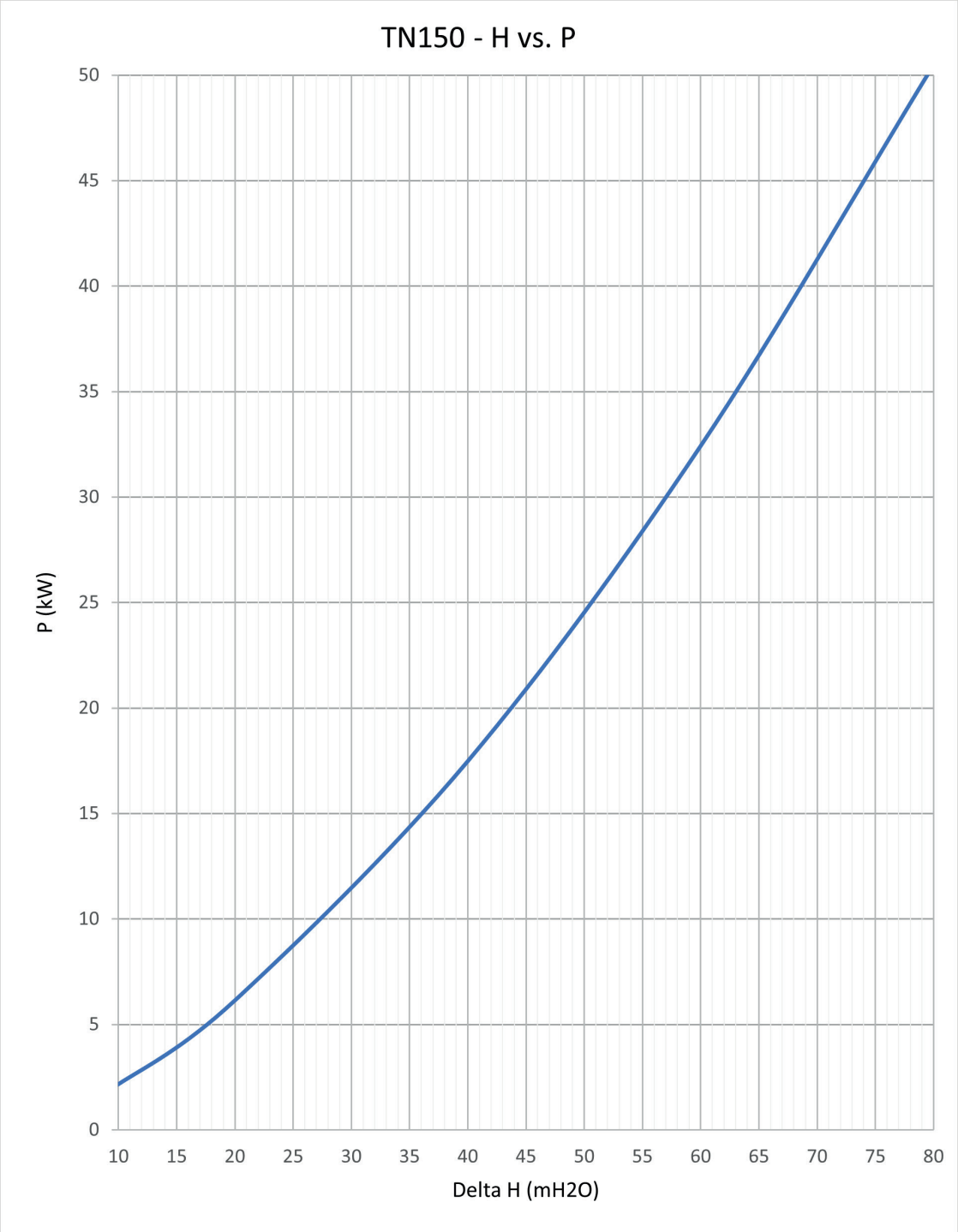
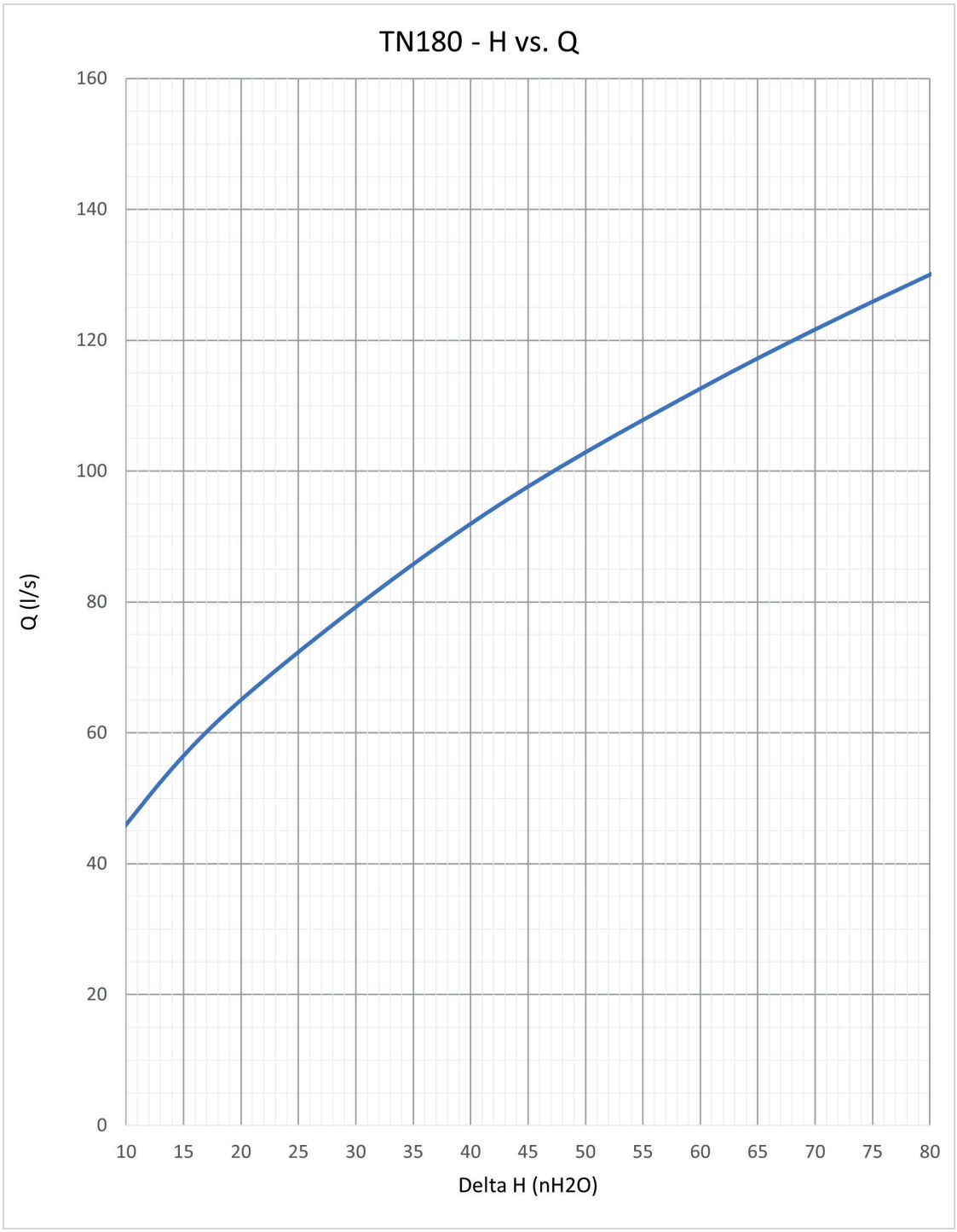


TN180 GROUP

DELTA H VS. FLOW



TN 180 GROUP

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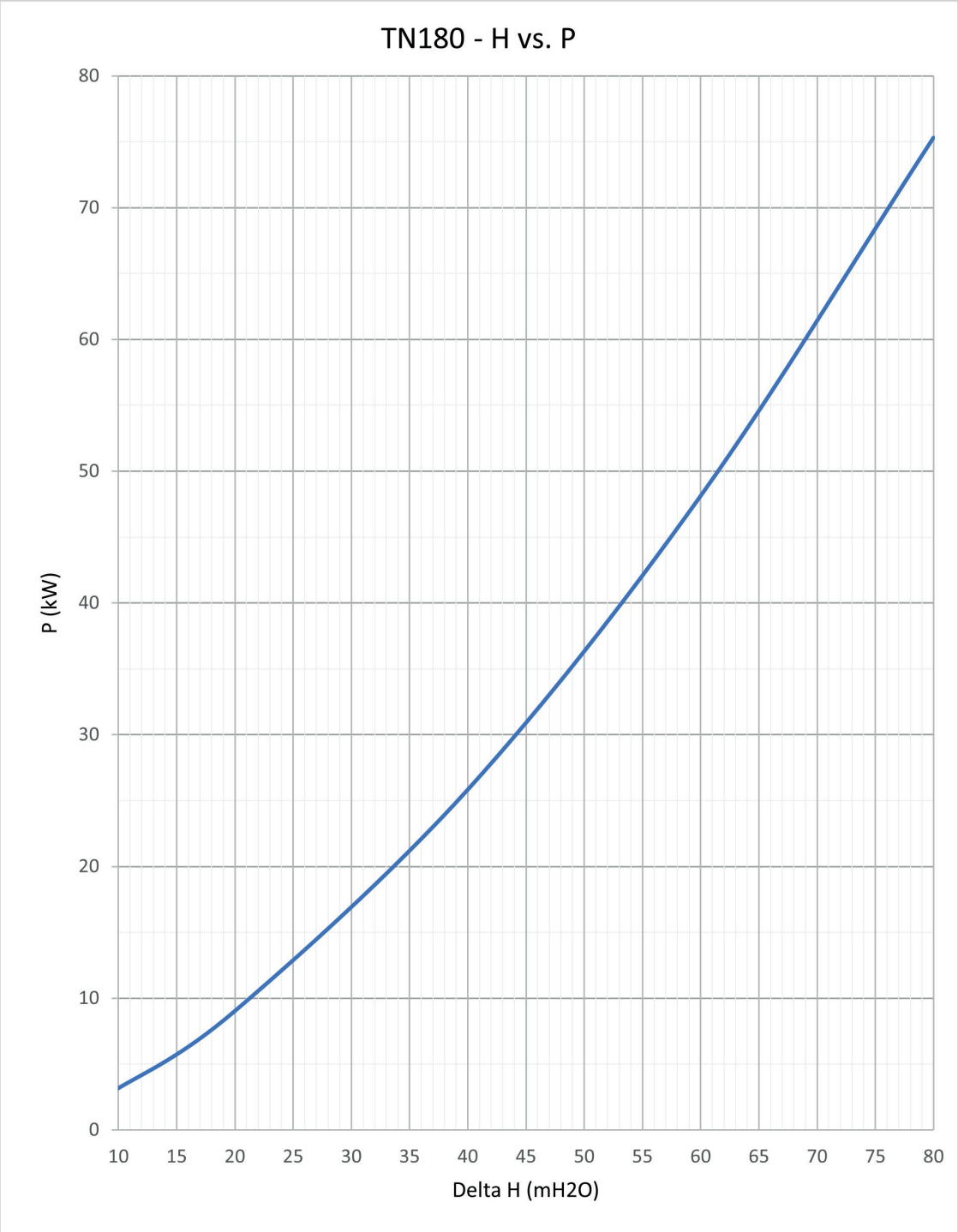
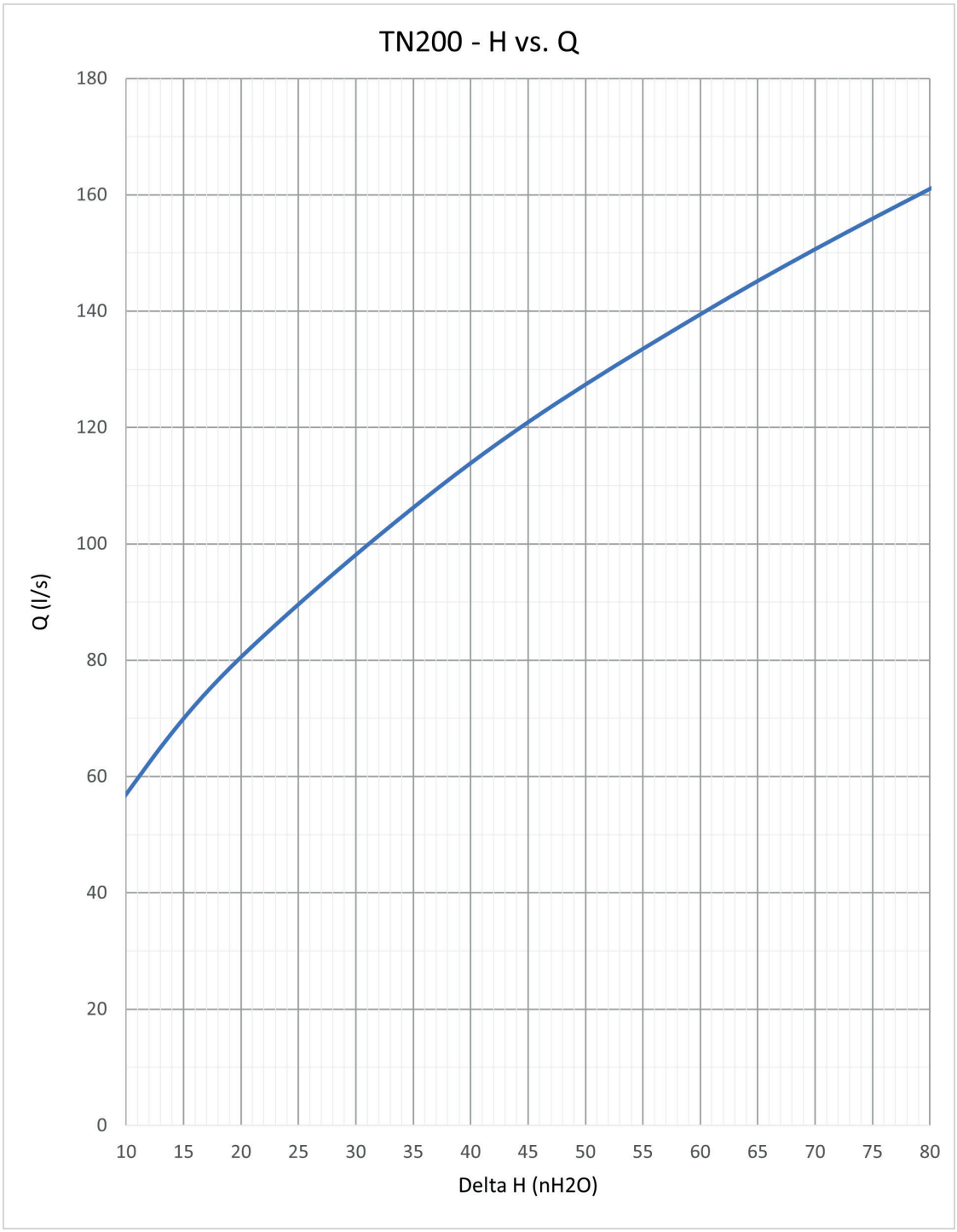


TN200 GROUP

DELTA H VS. FLOW



TN200 GROUP

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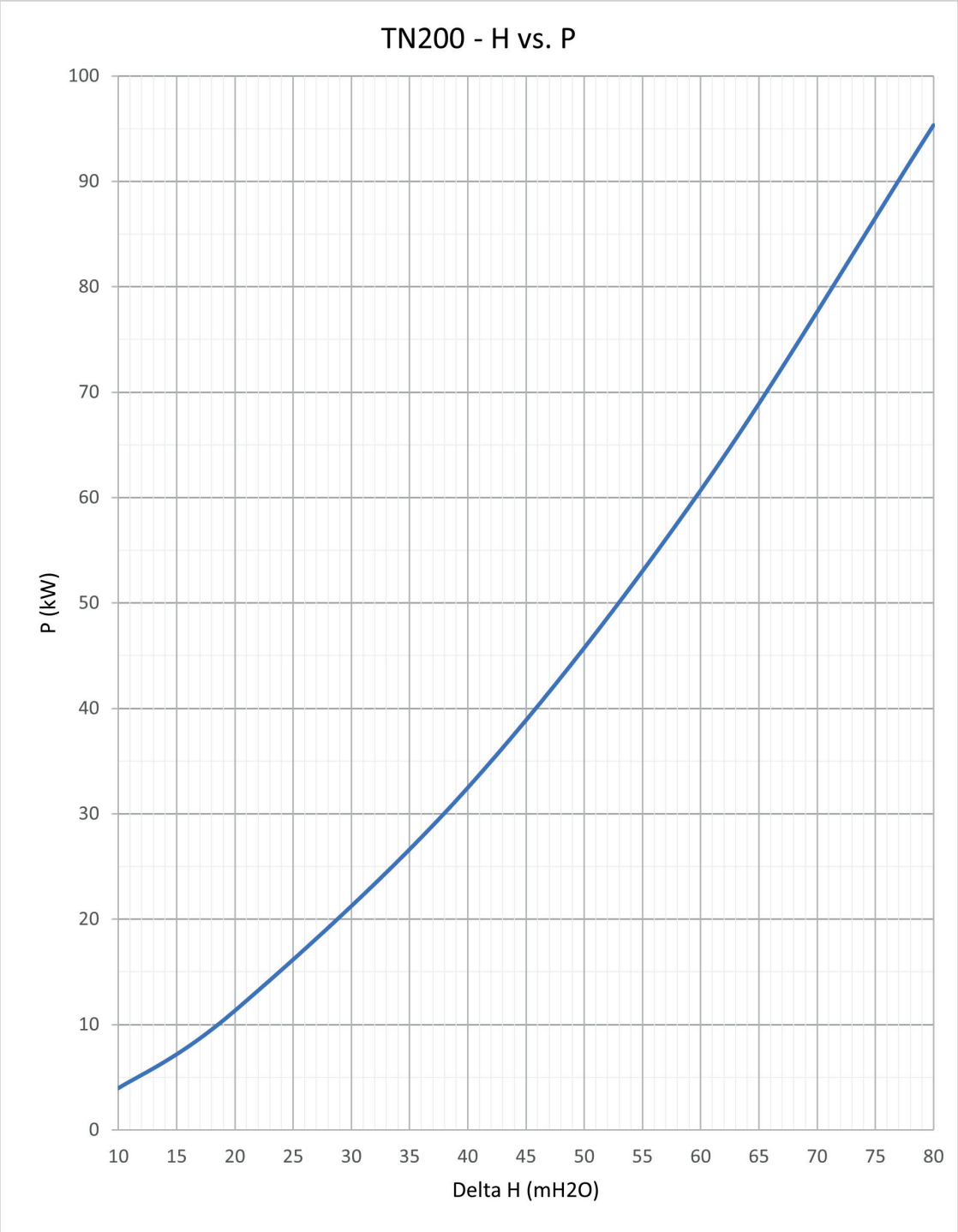
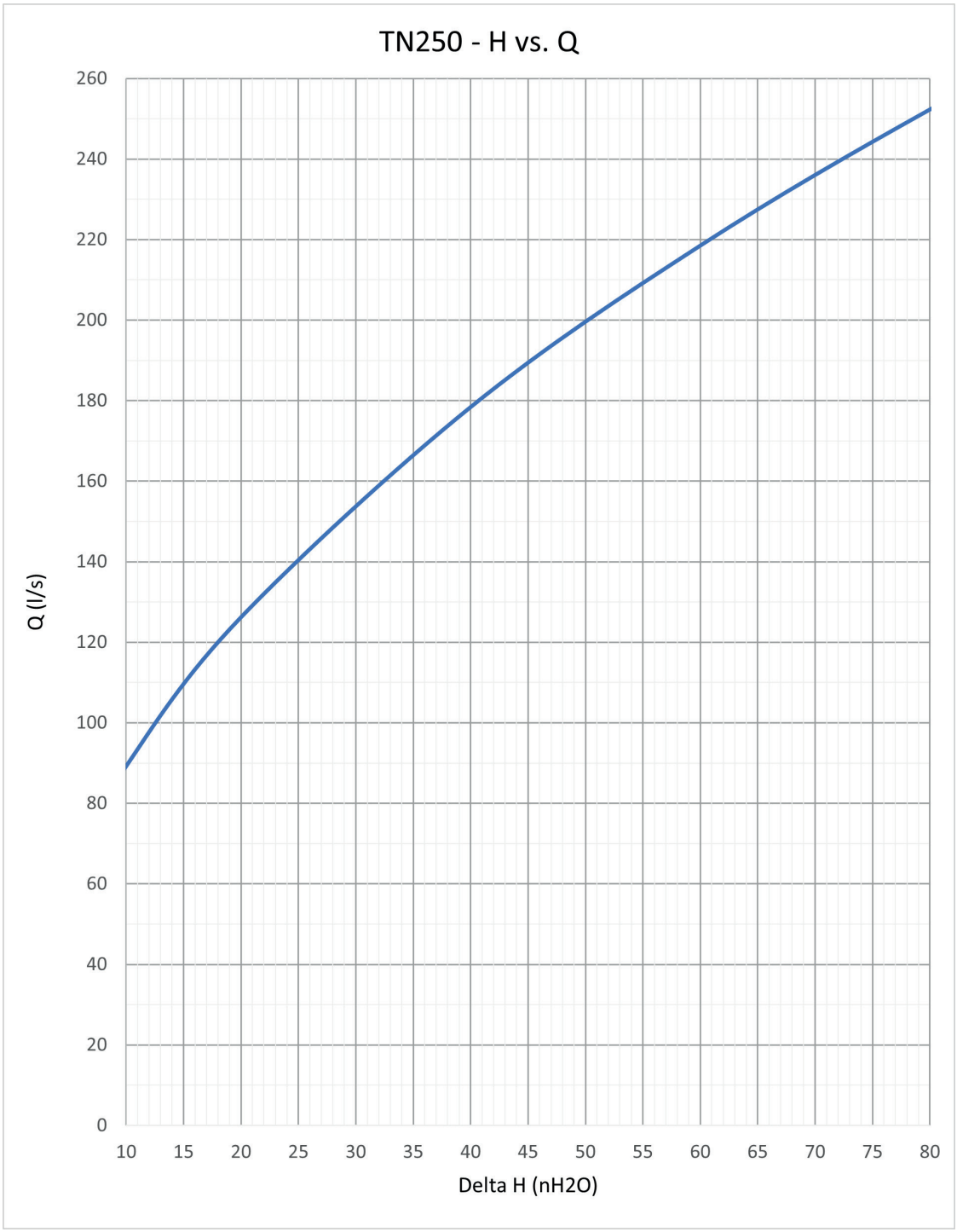


TN250 GROUP

DELTA H VS. FLOW



TN250 GROUP

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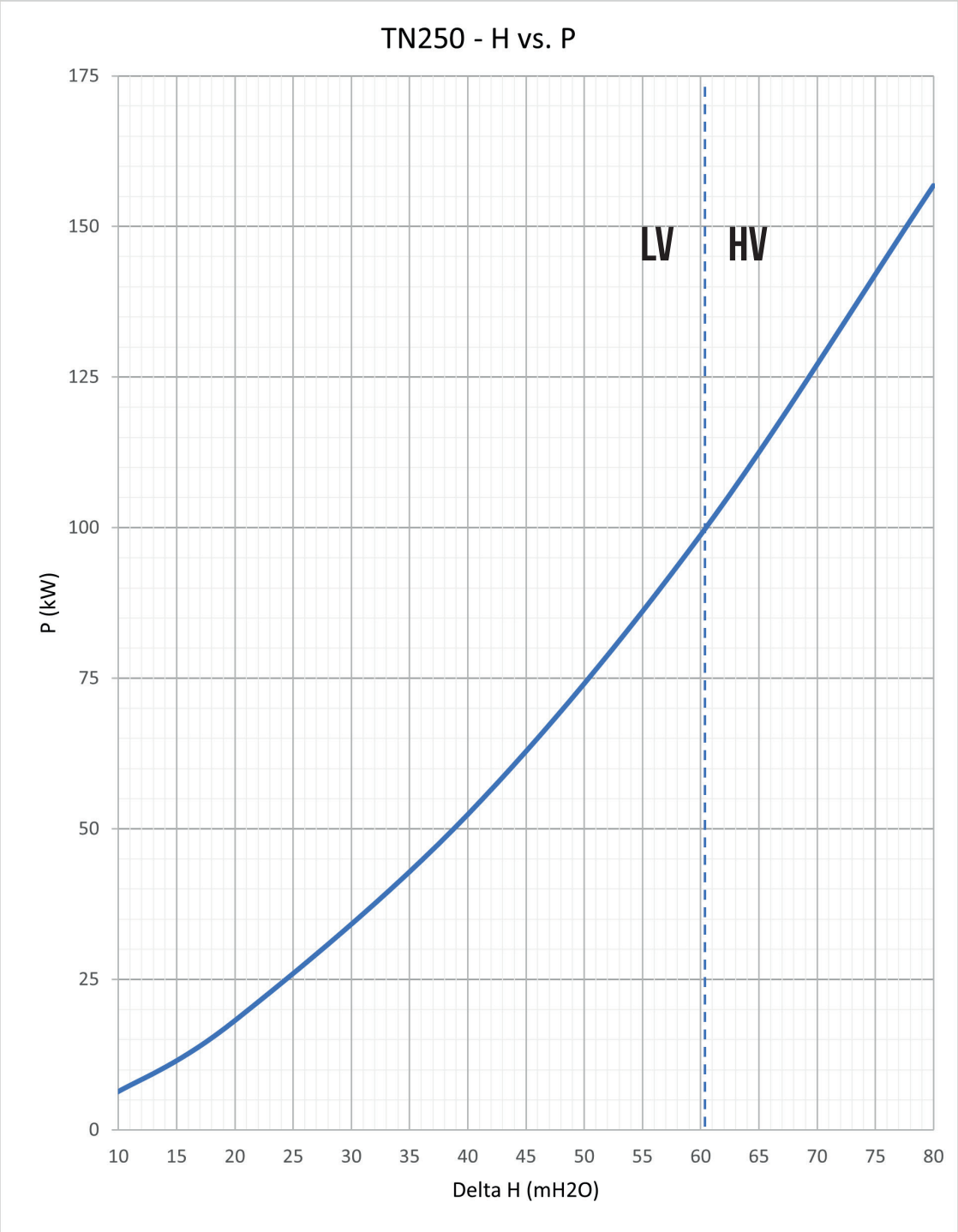
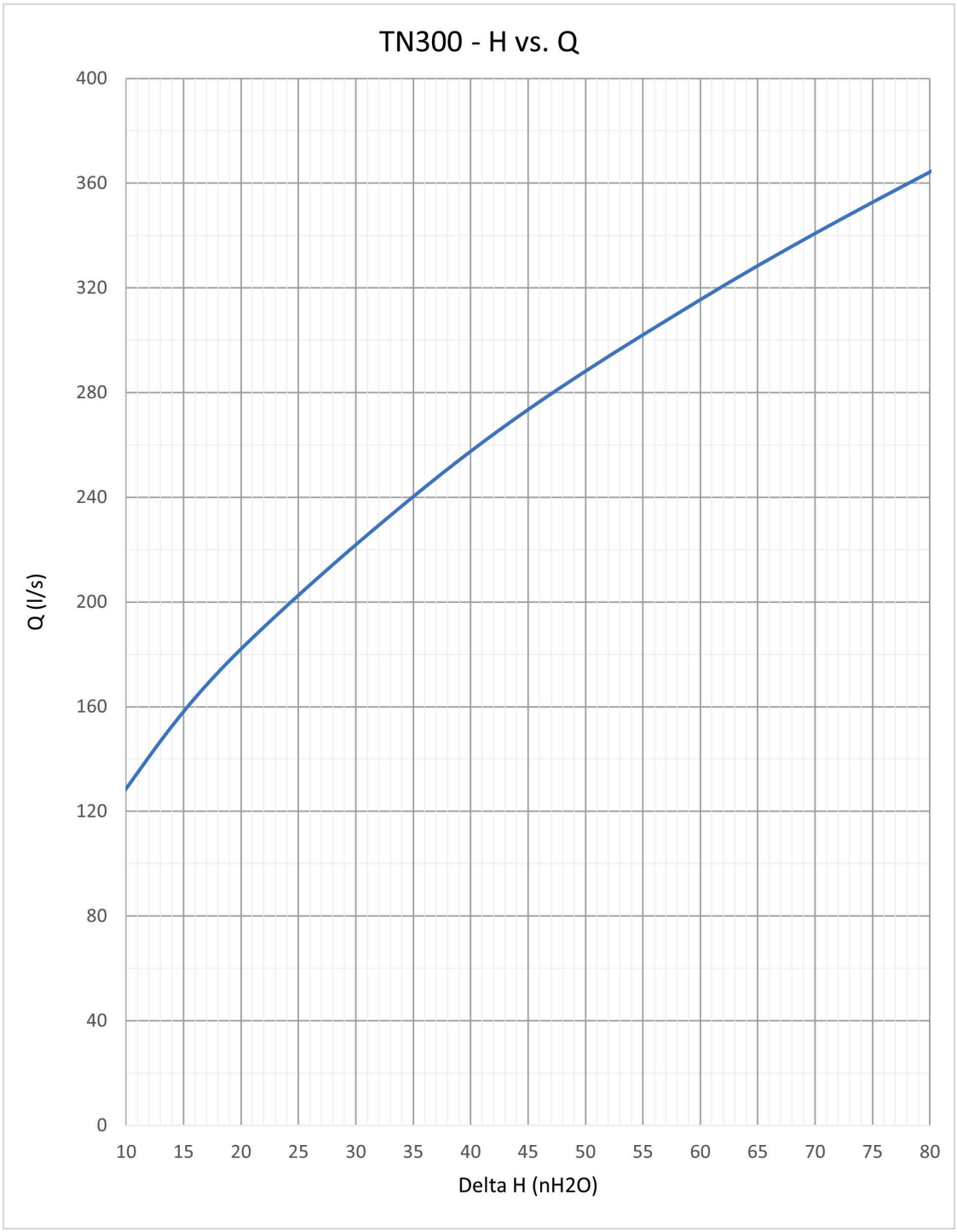


TN300 GROUP

DELTA H VS. FLOW



TN300 GROUP

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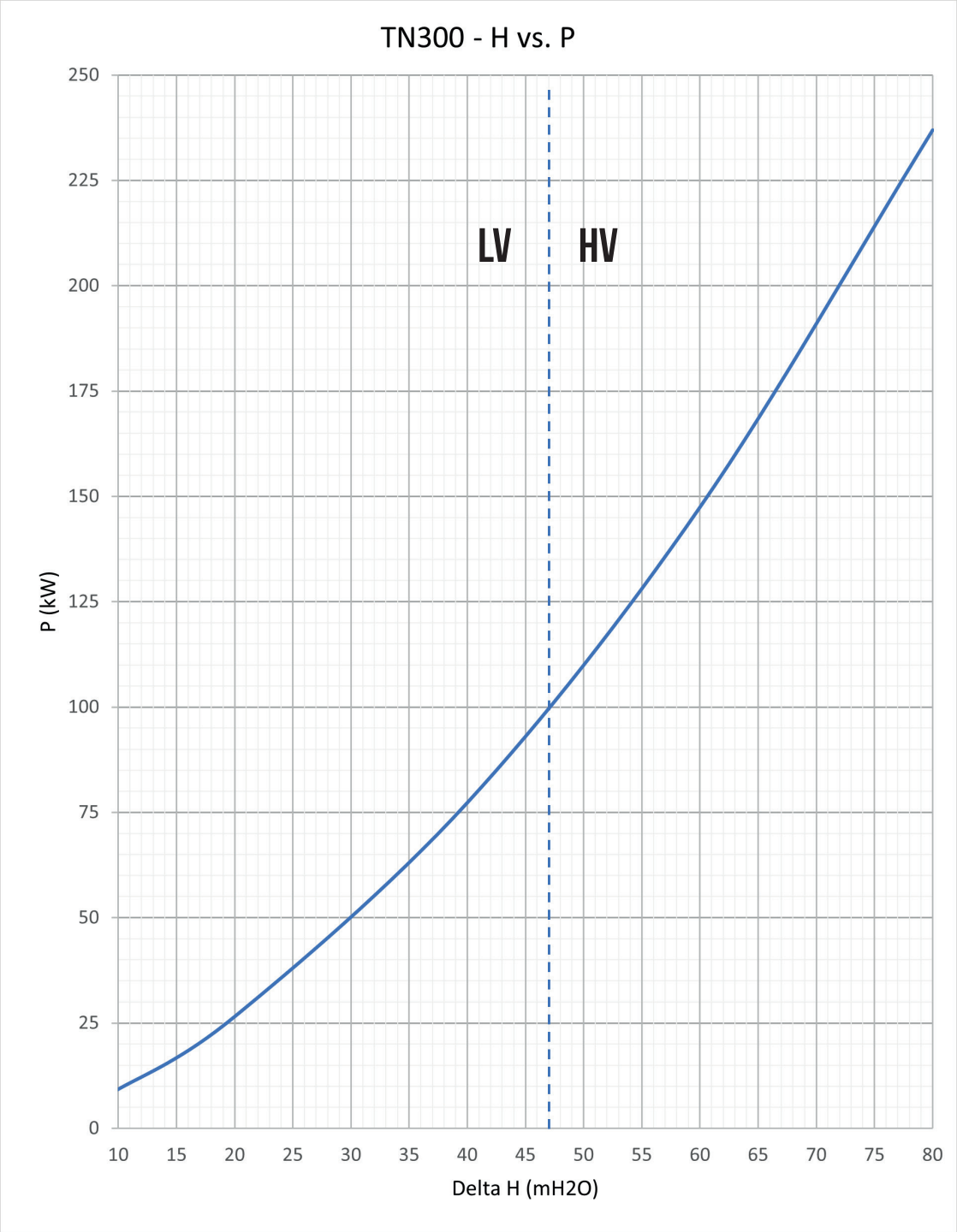

TN350 GROUP

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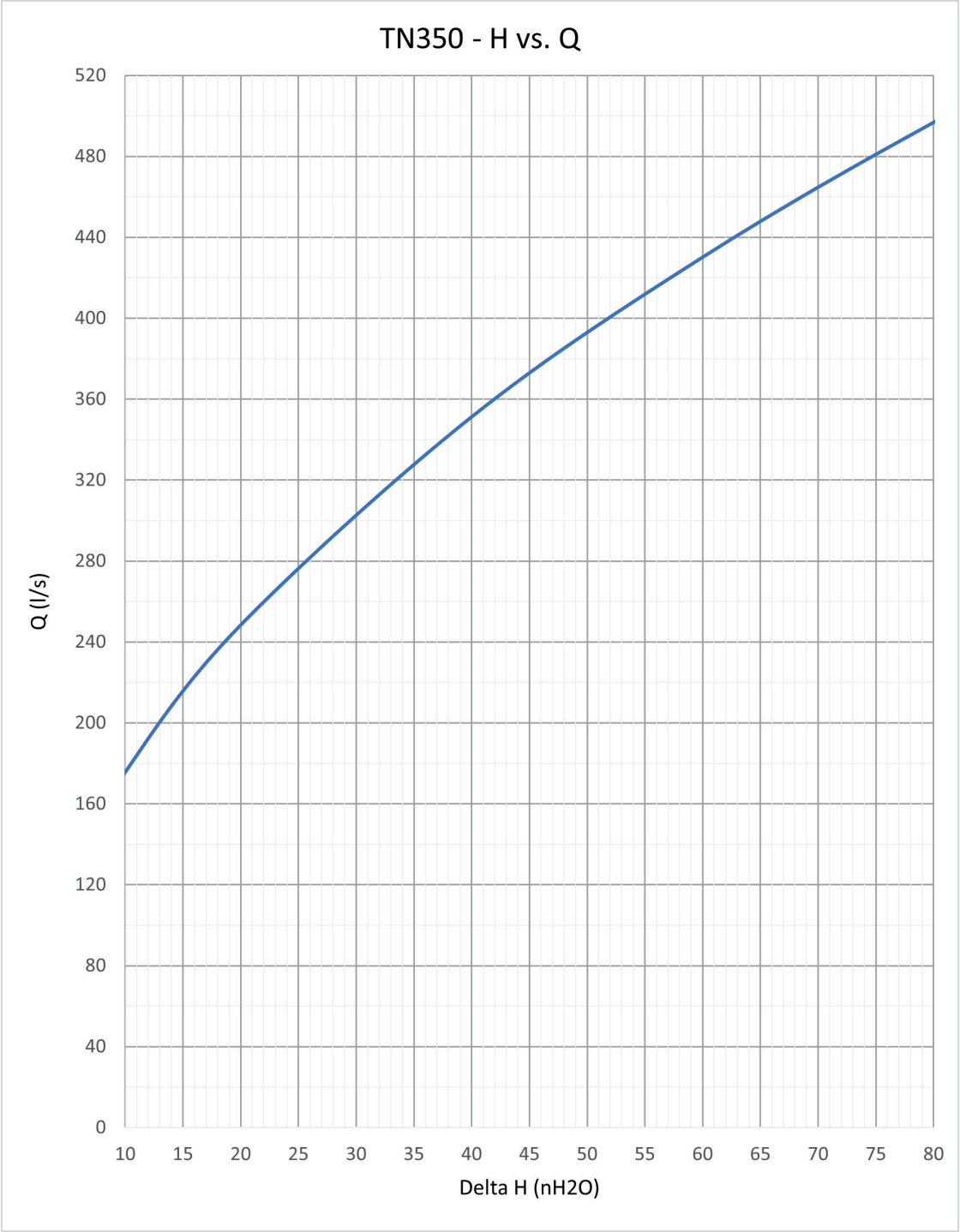

TN350 GROUP

DELTA H VS. PRODUCED POWER