

# ProPhase™

## Dense phase pneumatic conveyor



- 40 years of continuous improvement for leading reliability
- Energy efficient, rates up to 250 tph and distances up to 750m
- Totally enclosed - dust free
- Very low pipe wear
- Extremely low degradation of fragile bulk solids
- Conveying pipelines from DN50 to DN300 and vessel volumes 0.23m<sup>3</sup> to 6.2m<sup>3</sup>
- Proprietary PHASiQ controller for fast start-up, or DCS / PLC integrated
- CE / PED / ATEX / ASME approved

### Description:

The ProPhase™ is the latest version of the well proven dense phase pneumatic conveying technology from Schenck Process.

Highly standardised and modular, the ProPhase is suited for almost any powder or granular pneumatic conveying requirement.

40 years of evolution have ensured the latest version is the most reliable and energy efficient yet, whilst bringing benefits to the customer of maximum plant production coupled with minimum operating cost.

Incorporating our Clyde Process ProDV Dome Valve, the ProPhase™ can perform up to 250,000 cycles between minor services and up to 1m between major ones.

The performance of the ProPhase™ for a given application can be verified in our UK test centre, with conveying distances up to 260m, if required.

The ProPhase™ can be supplied standalone for integration into an existing dense phase system.

Alternatively, a full dense phase pneumatic conveying solution can be provided, incorporating any necessary diverter valves, feed hoppers, dust filters, pipework and feed systems.

Low cost sequence control of the ProPhase™ can be achieved with the intelligent PHASiQ controller, including AS-I (Actuator Sensor Interface) remote I/O (input/output) and gateways for operation of e.g. diverter valves and silo level monitoring.

Alternatively, the ProPhase™ system can be supplied with a customer specific PLC (programmable logic controller) control system, or ready for integration into the plant DCS (distributed control system) and SCADA (Supervisory control and data acquisition) network.

The ProPhase™ incorporates many other features that contribute to its performance:

The conveying air distribution manifold is designed to prevent powder back flow to maximise valve life.

Vessel and valve flow surfaces can be treated with non-stick or corrosion resistant coatings.

Conveying pressures are dynamically controlled by regulator valves to minimise power consumption, wear and bulk solids degradation.

Density Stabiliser pipeline air injection units can be added at regulator intervals to convey even difficult bulk solids gently and reliably.

For root cause, quick analysis, all key process variables can be monitored and stored on the PHASiQ controller for up to 5 years.

**Functions:**

- Can achieve phase densities up to 200:1
- Bulk solid temperatures up to 200°C as standard
- Can convey at velocities as low as 2 m/s at the pipeline start

**Associated Accessories:**

- Refer to PHASiQ datasheet for control functions, communication protocols and IoT
- Refer to Silo Filtration datasheet for information about dust suppression at receiving bins

- Refer to Density Stabiliser Datasheet for more information about pipeline air injection functions
- Refer to the ProDV-Divert, ProDV-Fill and ProDV-Bypass datasheets for more information about the conveying pipeline routing functions

**Technical Data:**

Detailed general arrangement drawings can be obtained using the drawing number given on the family product range chart.

Design Pressure	7.0 barg for a maximum working pressure 5.0 barg
Pressure Vessel Codes	CE Pressure Equipment Directive EN13445 ASME VIII Div 1 available by request
Pressure Vessel Materials	Carbon steel for pressure bearing housings Stainless steel available by request
Pressure Vessel Design Cycles	Between 2,000,000 and 4,000,000 depending on the expected working pressure Increased cycle life available by request
Solids Handling Valve Materials	SG iron for pressure bearing housing Stainless steel available by request
Air Distribution Manifold materials	Main pipe and fittings grade 304 stainless steel
Pneumatic Control Piping	Nylon or PU tube, with push-fit connectors
Process Panel Enclosure	Protection not lower than IP54
Level Switch Voltage	DC 24V or AC 110V / 240 V 50 Hz 60 Hz
Pneumatic Panel / Control Voltage	DC 24V or AC 110V / 240 V 50 Hz 60 Hz
Pressure Transmitter Voltage	DC 24V or AC 110V / 240 V 50 Hz 60 Hz
ATEX Rating	Cat 1 / 2 D, declaration details request

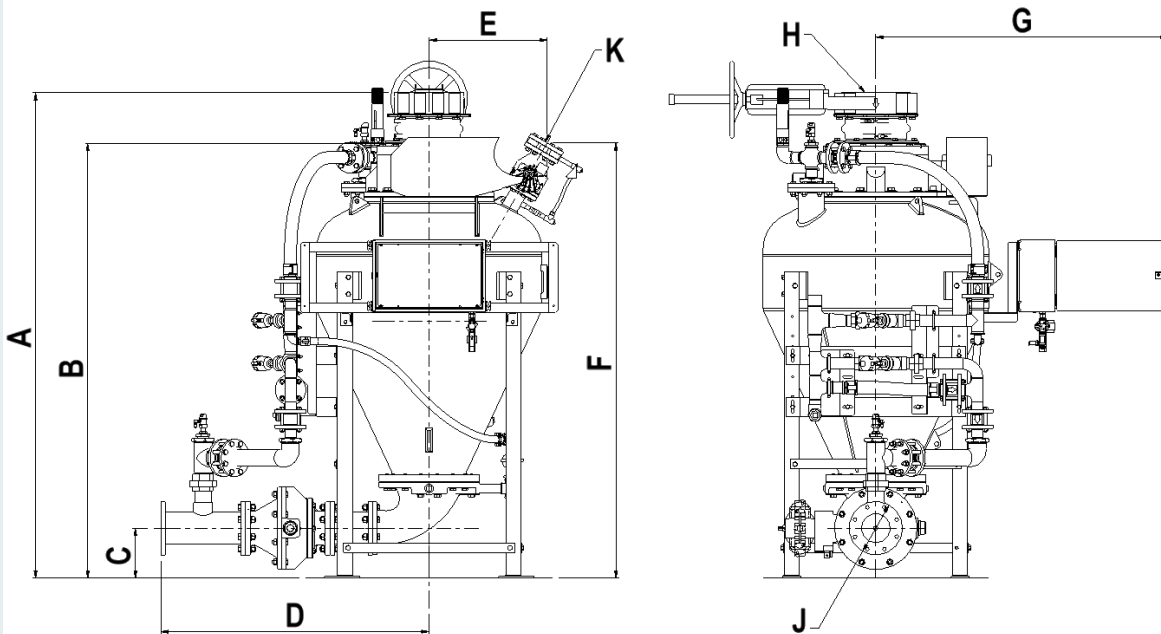
**Increased performance and capabilities can be provided with the following additional options:**

Bulk Solids Temperatures up to 350°C	ProDV Dome valves can be equipped with water cooling for very hot applications
Bulk Solids Handling Valve Coatings	ENP coated, tungsten carbide coated, PTFE coated, chrome coated can be added for erosive, abrasive or sticky bulk solids
Optional Upgrade Retro-fit Package Available	The ProPhase™ constituent parts can be fitted to older Densphase conveyors as part of an upgrade service
Dual Vessel or Tandem ProPhase™ Combinations	Two ProPhase™ units can be connected to one conveying pipeline in order to further increase conveying capacity or energy efficiency, or to reduce the height required for a surge hopper

**Examples of bulk solids conveyed by the ProPhase™ dense phase conveyor:**

- Chemicals, e.g. sodium carbonate, sodium sulphate, phosphate, petrochemical catalyst
- Building materials, e.g. cement, limestone, sand, fly ash, aggregates
- Metal processing, e.g. coal, iron ore, lime, non ferrous concentrates (nickel, copper)
- Food ingredients, e.g. sugar, tea leaf, grain, starch

**Key dimensions and weights for 150mm conveying lines and below:**



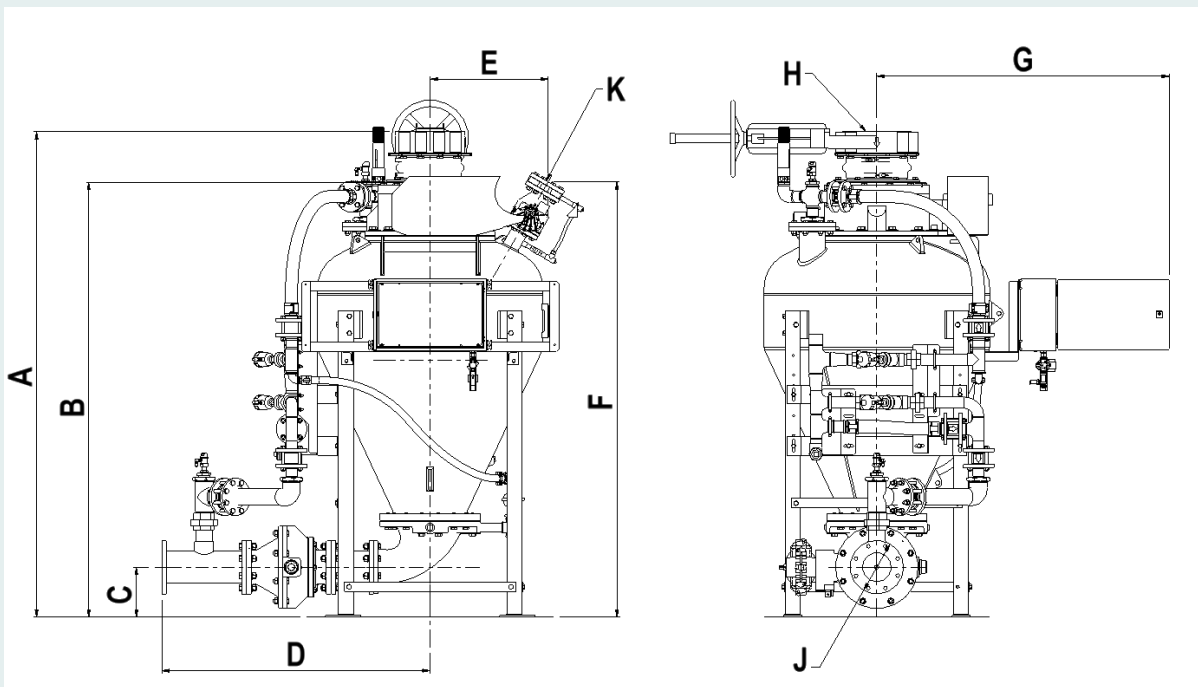
MODEL	A	B	C	D	E	F	G	H	J	K	Mass (empty)
8/8/3	1787	1542	242	892	496	1590	1399	DN200	DN80	DN50	670
12/8/3	1980	1735	250	892	521	1769	1399	DN200	DN80	DN50	732
8/8/4	1787	1542	218	1087	496	1590	1399	DN200	DN100	DN50	744
12/8/4	1980	1735	226	1087	521	1769	1399	DN200	DN100	DN50	779
8/8/5	1789	1544	321	1354	496	1590	1399	DN200	DN125	DN50	868
12/8/5	1980	1735	321	1354	521	1769	1399	DN200	DN125	DN50	891
12/12/5	2134	1864	302	1354	619	2019	1474	DN300	DN125	DN80	1229
20/8/5	2178	1931	289	1354	596	1950	1556	DN200	DN125	DN50	1105
20/12/5	2273	2003	289	1354	628	2006	1556	DN300	DN125	DN80	1336
30/8/5	2489	2244	313	1354	608	2282	1556	DN200	DN125	DN50	1193
30/12/5	2585	2315	313	1354	628	2317	1556	DN300	DN125	DN80	1427
12/8/6	1980	1735	275	1428	521	1769	1399	DN200	DN150	DN50	918
12/12/6	2134	1864	254	1428	618	2018	1474	DN300	DN150	DN80	1255
20/8/6	2178	1933	243	1428	596	1950	1556	DN200	DN150	DN50	1132
20/12/6	2272	2002	243	1428	628	2006	1556	DN300	DN150	DN80	1364
30/8/6	2489	2247	267	1428	608	2282	1556	DN200	DN150	DN50	1220
30/12/6	2585	2315	267	1428	628	2317	1556	DN300	DN150	DN80	1454
50/12/6	2961	2691	282	1428	696	2651	1618	DN300	DN150	DN80	1807
70/12/6	3227	2957	274	1428	773	2916	1703	DN300	DN150	DN80	2099
100/12/6	3662	3392	274	1428	773	3351	1703	DN300	DN150	DN80	2304
150/12/6	3970	3700	270	1428	928	3610	1870	DN300	DN150	DN80	3364

All dimension are provisional and will be finalised during order processing

All dimension in mm and mass in Kg

All bulk solid handling connections PN10, all clean compressed air connection are BSP

**Key dimensions and weights for 200, 250 and 300mm conveying pipelines:**












































MODEL	A	B	C	D	E	F	G	H	J	K	Mass (empty)
20/8/8	2178	1933	310	1589	596	1950	1559	DN200	DN200	DN50	1471
20/12/8	2272	2002	310	1589	628	2006	1559	DN300	DN200	DN80	1703
30/8/8	2489	2247	334	1589	608	2282	1556	DN200	DN200	DN50	1563
30/12/8	2585	2313	334	1589	628	2317	1556	DN300	DN200	DN80	1797
50/12/8	2961	2691	351	1589	696	2651	1621	DN300	DN200	DN80	2151
70/12/8	3227	2957	343	1589	773	2916	1703	DN300	DN200	DN80	2442
100/12/8	3663	3393	343	1589	773	3351	1706	DN300	DN200	DN80	2646
150/12/8	3971	3701	338	1589	928	3610	1870	DN300	DN200	DN80	3702
220/12/8	4621	4351	338	1589	928	4260	1870	DN300	DN200	DN80	4213
30/12/10	2585	2328	355	1819	628	2317	1556	DN300	DN250	DN80	1988
50/12/10	2962	2692	369	1819	696	2651	1618	DN300	DN250	DN80	2336
70/12/10	3227	2957	363	1819	773	2916	1703	DN300	DN250	DN80	2625
100/12/10	3663	3393	363	1819	773	3351	1703	DN300	DN250	DN80	2830
150/12/10	3970	3703	361	1819	928	3610	1870	DN300	DN250	DN80	3886
220/12/10	4620	4350	361	1819	928	4260	1870	DN300	DN250	DN80	4397
50/12/12	2962	2692	404	1984	696	2651	1618	DN300	DN300	DN80	2521
70/12/12	3227	2960	399	1984	773	2916	1703	DN300	DN300	DN80	2812
100/12/12	3662	3392	399	1984	773	3351	1703	DN300	DN300	DN80	3017
150/12/12	3970	3700	397	1984	928	3610	1873	DN300	DN300	DN80	4068
220/12/12	4620	4353	397	1984	928	4260	1873	DN300	DN300	DN80	4578

All dimension are provisional and will be finalised during order processing

All dimension in mm and mass in Kg

All bulk solid handling connections PN10, all clean compressed air connection are BSP

**ProPhase™ model range and family chart:**

		VESSEL SIZE (VOLUME cuft / INLET VALVE inches)											
		8/8	12/8	12/12	20/8	20/12	30/8	30/12	50/12	70/12	100/12	150/12	220/12
CONVEYING LINE SIZE (INCHES)	12 300mm								 P111664	 P111637	 P111229	 P111230	 P111231
	10 250mm							 P111222	 P111224	 P111225	 P111226	 P111227	 P111228
	8 200mm				 P111211	 P111212	 P111213	 P111214	 P111216	 P111217	 P111218	 P111219	 P111220
	6 150mm		 P111200	 P111201	 P111202	 P111203	 P111204	 P111205	 P111207	 P111208	 P111209	 P111210	
	5 125mm	 P111189	 P111191	 P111192	 P111193	 P111194	 P111195	 P111196					
	4 100mm	 P111181	 P111183										
	3 80mm	 P111176	 P111178										
		0.23	0.34	0.34	0.57	0.57	0.85	0.85	1.42	2.0	2.8	4.2	6.2
		Volume - cu. m											

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