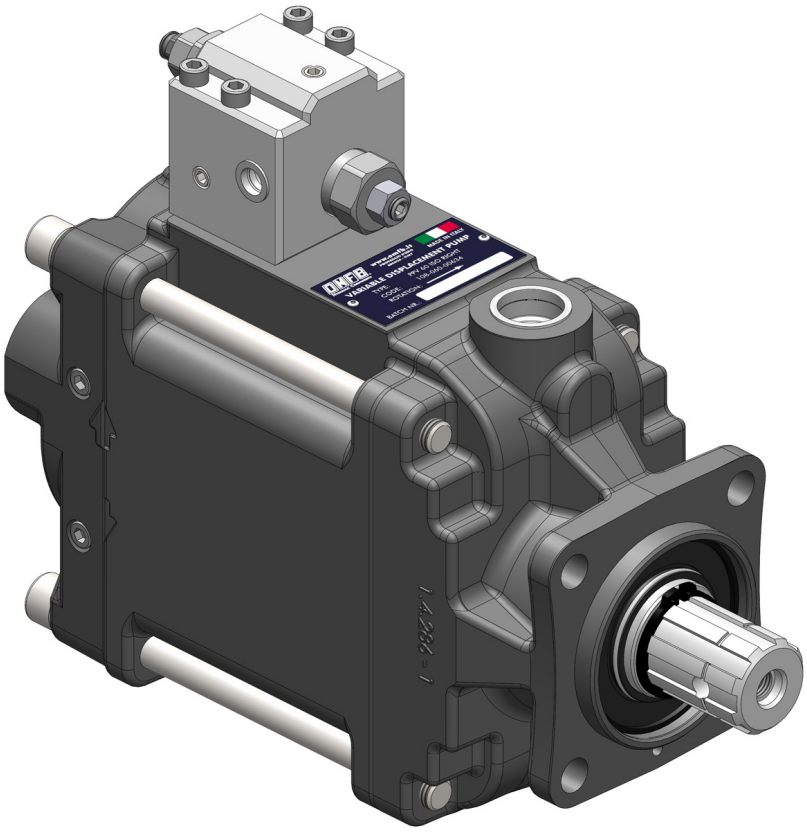
Pompe a cilindrata variabile - *Variable displacement pumps*
Bombas con cilindrada variable - Pompes à cylindrée variable
Pumpen mit variablem hub - Насосы с переменным объемом

PPV



IT	**Istruzioni di montaggio ed avviamento pompe a cilindrata variabile**	**pag. 03**
GB	*Start-up and mounting guide for variable displacement pumps*	*pag. 05*
E	*Istrucciones para el montaje y la puesta en marcha de las bombas con cilindrada variable*	*pag. 07*
FR	*Instructions de montage et dèmarrage des pompes à cylindrée variable*	*pag. 09*
D	*Anleitung zur montage und inbetriebnahme der pumpen mit variablem hub*	*pag. 11*
RU	*Инструкции по сборке и запуску hасосы с переменным объемом*	*pag. 13*

1. Assicurarsi che i componenti siano perfettamente puliti e non ci sia la presenza di contaminanti esterni.
2. Collegare tubazioni (fig. 1) e procedere al riempimento della pompa (fig. 2).
3. Al primo avviamento far funzionare la pompa per almeno 10 minuti ad una pressione compresa tra 50 e 100 bar.
4. Se necessario procedere alle regolazioni come riportato a pag.3.
5. In presenza di bassa temperatura, la pompa deve essere azionata senza carico finché l'olio non raggiunge una viscosità accettabile.

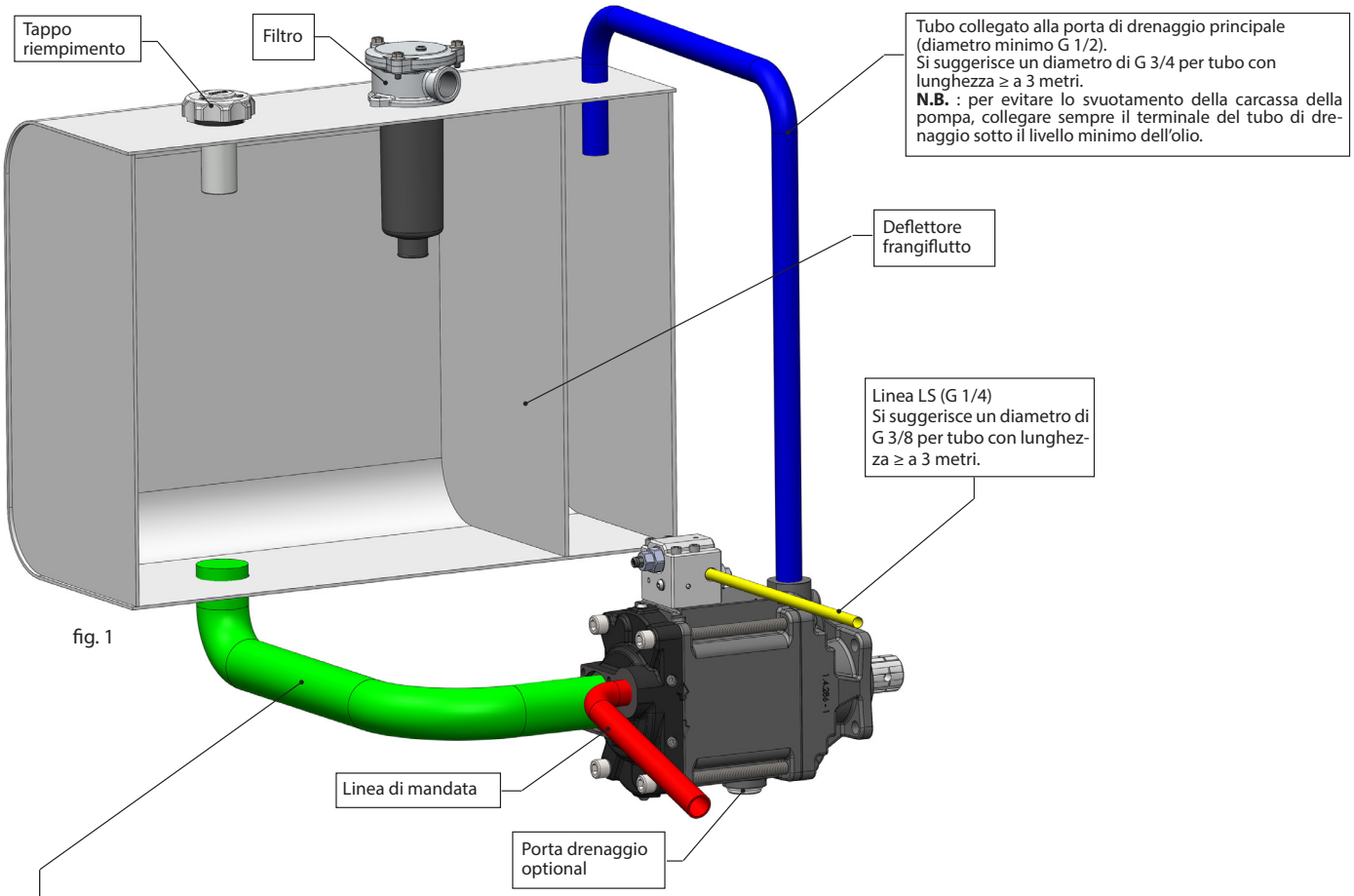


fig. 1

Ø TUBO ASPIRAZIONE [mm]									
Serie	Cilindrata [cc]	Velocità							
		800	1000	1200	1400	1600	1800	2000	2200
PPV	60	50							
	90	50		60					
	110	60					63		
	130	63				76			

FLUIDO IDRAULICO					
Fluido idraulico	Minerale o sintetico compatibile con guarnizioni: HNBR				
Temp. consentita	-25 +80 °C				
Viscosità cinematica consigliata	T media ambiente (°C)	< -40	-40÷10	10÷35	> 35
	VG (cSt = mm²/s)	16	22	32	46
Viscosità cinematica ottimale di esercizio			VG= 10 cSt ÷ 100 cSt		
Viscosità cinematica max consentita all'avviamento			VG= 750 cSt		
Indice di viscosità consigliato			VI > 100		

FILTRAZIONE			
Pressione di lavoro (bar)	ΔP<140	140<ΔP<210	ΔP>210
Contaminazione classe NAS 1638	9	8	7
Contaminazione classe ISO 4406-1999	20/18/15	19/17/14	18/16/13
Da ottenere con filtro βx >75 secondo ISO 16889	10 µm		

RIEMPIMENTO	
Prima dell'avviamento della pompa PPV, è necessario riempire la stessa con almeno l'80% del volume massimo.	
Capacità totale PPV 60-90-110	800ml
Capacità totale PPV 130	900ml

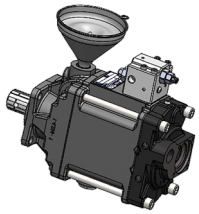


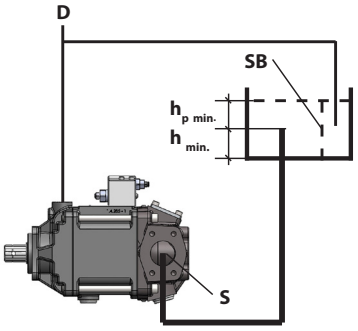
fig. 2

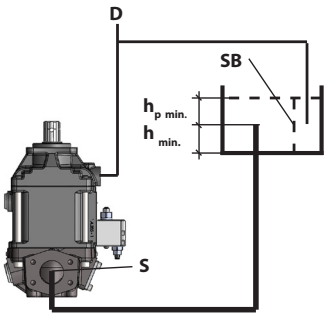
N.B.: il nostro Servizio Tecnico è a completa disposizione per qualsiasi ulteriore informazione.

Posizioni di montaggio e regolazioni

INSTALLAZIONE

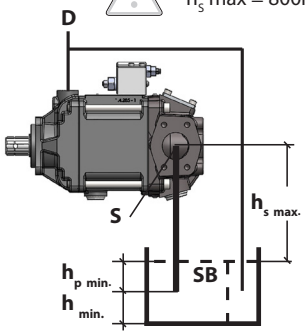
Sotto del serbatoio (standard)

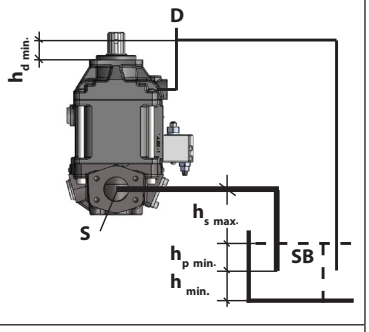




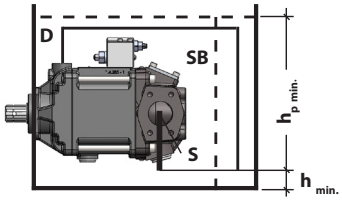
Sopra del serbatoio

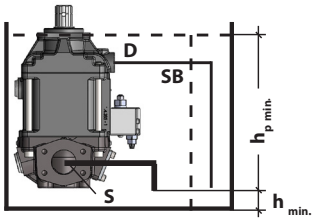
h_{ES} min = 25mm
h_S max = 800mm



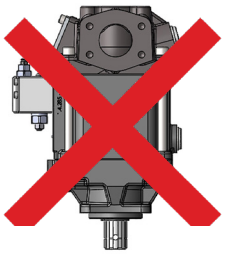


All'interno del serbatoio





Errato montaggio

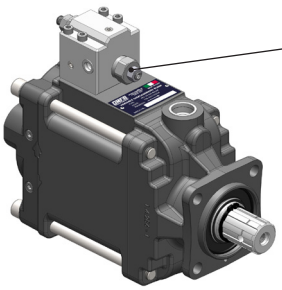


NO!

LEGENDA

D	Riempimento / Drenaggio
S	Aspirazione
SB	Parete compensazione (deflettore frangiflutto)
$h_{p\ min.}$	Profondità della pompa nel serbatoio (200mm)
$h_{min.}$	Distanza minima necessaria dal fondo serbatoio (100mm)
$h_{d\ min.}$	Altezza minima necessaria per la protezione dallo svuotamento della PPV (25mm)
$h_{s\ max.}$	Altezza di aspirazione massima ammessa (800mm)

VALVOLA LS



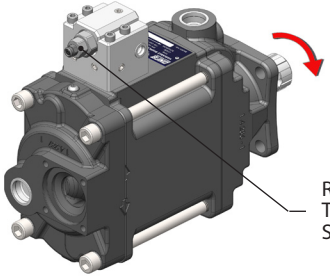
Valvola LS
Taratura standard: 25bar
Setting: 15bar/rev.

13 mm

4 mm

Aumentare la taratura del Load Sensing per incrementare la reattività della pompa.

VALVOLA DI MASSIMA



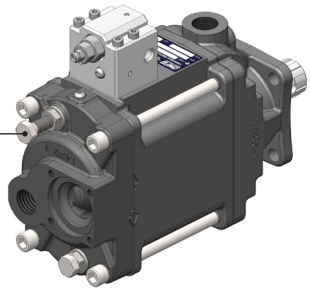
8 mm

2.5 mm

Regolatore di pressione massima
Taratura standard: 330bar
Setting: 80 bar/rev.

TARATURA VERSIONI "ADJUSTABLE"

PPV 60-90-110 ADJ



19 mm

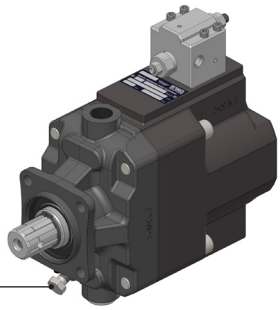
La vite di registro posteriore "**ADJUSTABLE**" limita la cilindrata massima della pompa.

CILINDRATA	60cc	90cc	110cc
Campo regolazione	40 - 60 cm³	55 - 90 cm³	85 - 110 cm³
Regolazione	4,3 cm³/rev	5,7 cm³/rev	6,6 cm³/rev

PPV 130 ADJ

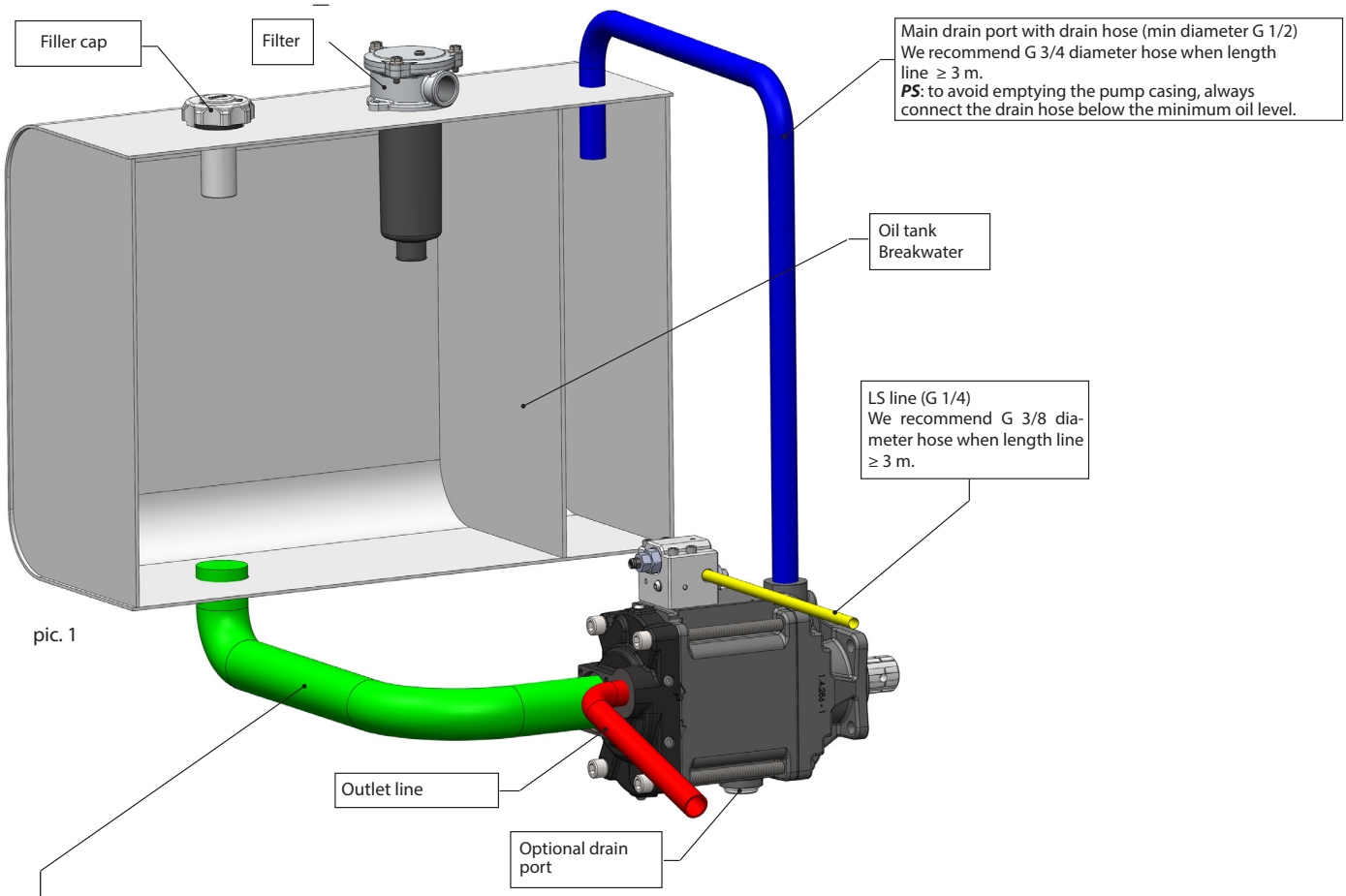
La vite di registro anteriore "**ADJUSTABLE**" limita la cilindrata massima della pompa.

19 mm



CILINDRATA	130cc
Campo regolazione	90 - 130 cm³
Regolazione	12 cm³/rev

1. Make sure all the components are clean and there are no external contaminations inside.
2. Connect hoses (pic. 1) and fulfill the pump (pic. 2)
3. During first start-up run the pump with delivery pressure between 50 and 100 bar for at least 10 min.
4. Please adjust set-up according settings on page 7 if needed.
5. In case of low temperature the pump has to run without load until the oil reaches a proper viscosyt (fluid page 6).



pic. 1

Ø SUCTION HOSE [mm]									
Series	Displacement [cc]	Speed							
		800	1000	1200	1400	1600	1800	2000	2200
PPV	60	50							
	90	50		60					
	110	60					63		
	130	63				76			

HYDRAULIC FLUID					
Fluid	Mineral or synthetic compatible with the following seals: HNBR				
Allowed temperature range	-25 +80 °C				
Kinematic viscosity suggested	Viscosity index suggested (°C)	< -40	-40÷10	10÷35	> 35
	VG (cSt = mm²/s)	16	22	32	46
Optimale kinematic viscosity			VG= 10 cSt ÷ 100 cSt		
Max kinematic viscosity suggested at start-up			VG= 750 cSt		
Viscosity index suggested			VI > 100		

FILTRATION			
Working pressure (bar)	ΔP<140	140<ΔP<210	ΔP>210
Contamination class NAS 1638	9	8	7
Contamination class ISO 4406-1999	20/18/15	19/17/14	18/16/13
To be optained with filter βx >75 according ISO 16889	10 µm		

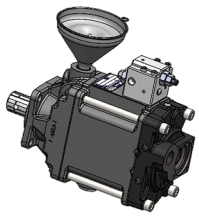
PUMP FILLING		
Please full fill at least 80% capacity volume before pump start-up		
	PPV 60-90-110 total capacity	800ml
	PPV 130 total capacity	900ml

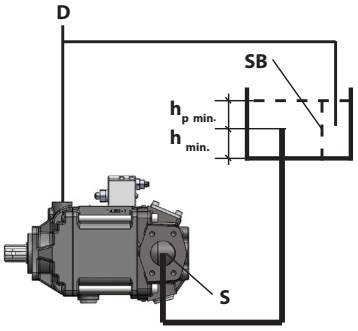
fig. 2

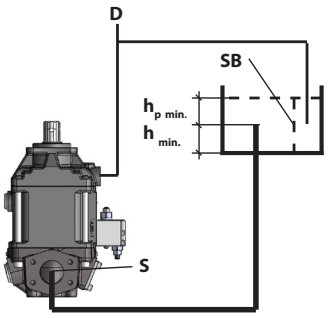
N.B .: our Technical Service is at your complete disposal for any further information.

Mounting positions and settings

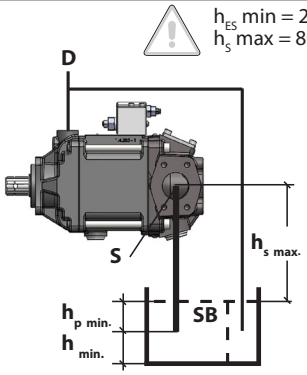
INSTALLATION

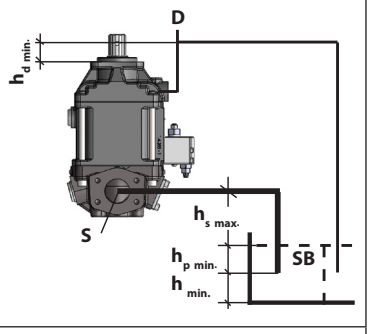
Below oil tank (standard)



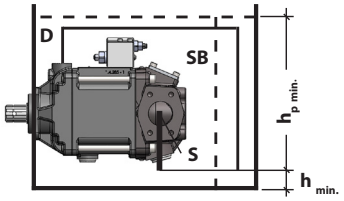


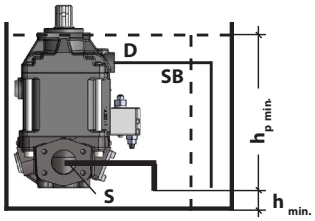
Above oil tank



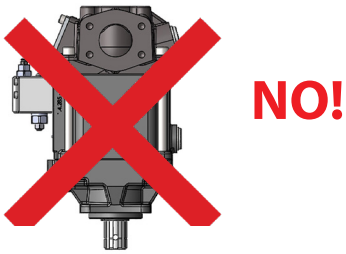


Inside oil tank



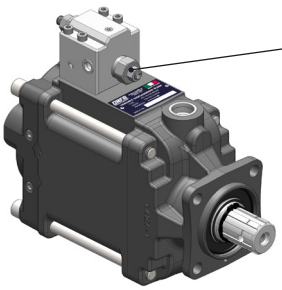


Wrong installation



LEGENDA	
D	Filling / Drainage
S	Suction
SB	Oil tank breakwater
$h_{p\ min.}$	Pump depth inside oil tank (200mm)
$h_{min.}$	Min. distance from oil tank bottom (100mm)
$h_{d\ min.}$	Min. height to prevent PPV body emptyng (25mm)
$h_{s\ max.}$	Max. allowed suction height (800mm)

LS VALVE



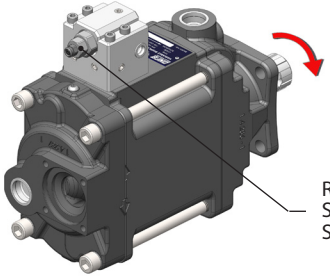
LS valve
Standard setting: 25bar
Setting: 15bar/rev.

13 mm

4 mm

Increase LS Valve setting to increase pump reactivity.

RELIEF_VALVE



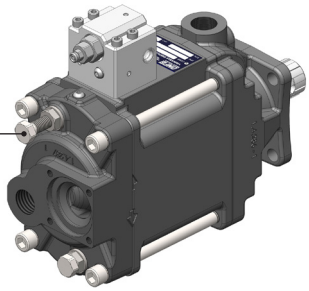
8 mm

2.5 mm

Relief valve setting
Standard setting: 330bar
Setting: 80 bar/rev.

SETTING "ADJUSTABLE" VERSIONS

PPV 60-90-110 ADJ



19 mm

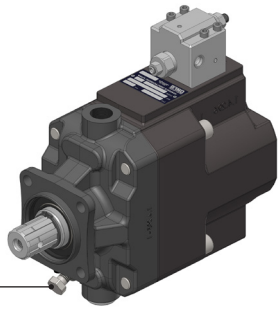
The ***ADJUSTABLE*** rear screw, allowed the operator to set the pump displacement.

DISPLACEMENT	60cc	90cc	110cc
Set-up range	40 - 60 cm³	55 - 90 cm³	85 - 110 cm³
Setting	4,3 cm³/rev	5,7 cm³/rev	6,6 cm³/rev

PPV 130 ADJ

The ***ADJUSTABLE*** front screw, allowed the operator to set the pump displacement.

19 mm



DISPLACEMENT	130cc
Set-up range	90 - 130 cm³
Setting	12 cm³/rev

1. Asegúrese de que los componentes estén perfectamente limpios y no haya contaminantes externos.
2. Conecte las tuberías (fig. 1) y pase a llenar la bomba (fig. 2).
3. En la primera puesta en marcha haga funcionar la bomba al menos 10 minutos a una presión entre los 50 y los 100 bar.
4. Si es necesario, haga los ajustes como se indica en la pág.3.
5. Si hay baja temperatura, la bomba debe ponerse en marcha en vacío hasta que el aceite tenga una viscosidad aceptable.

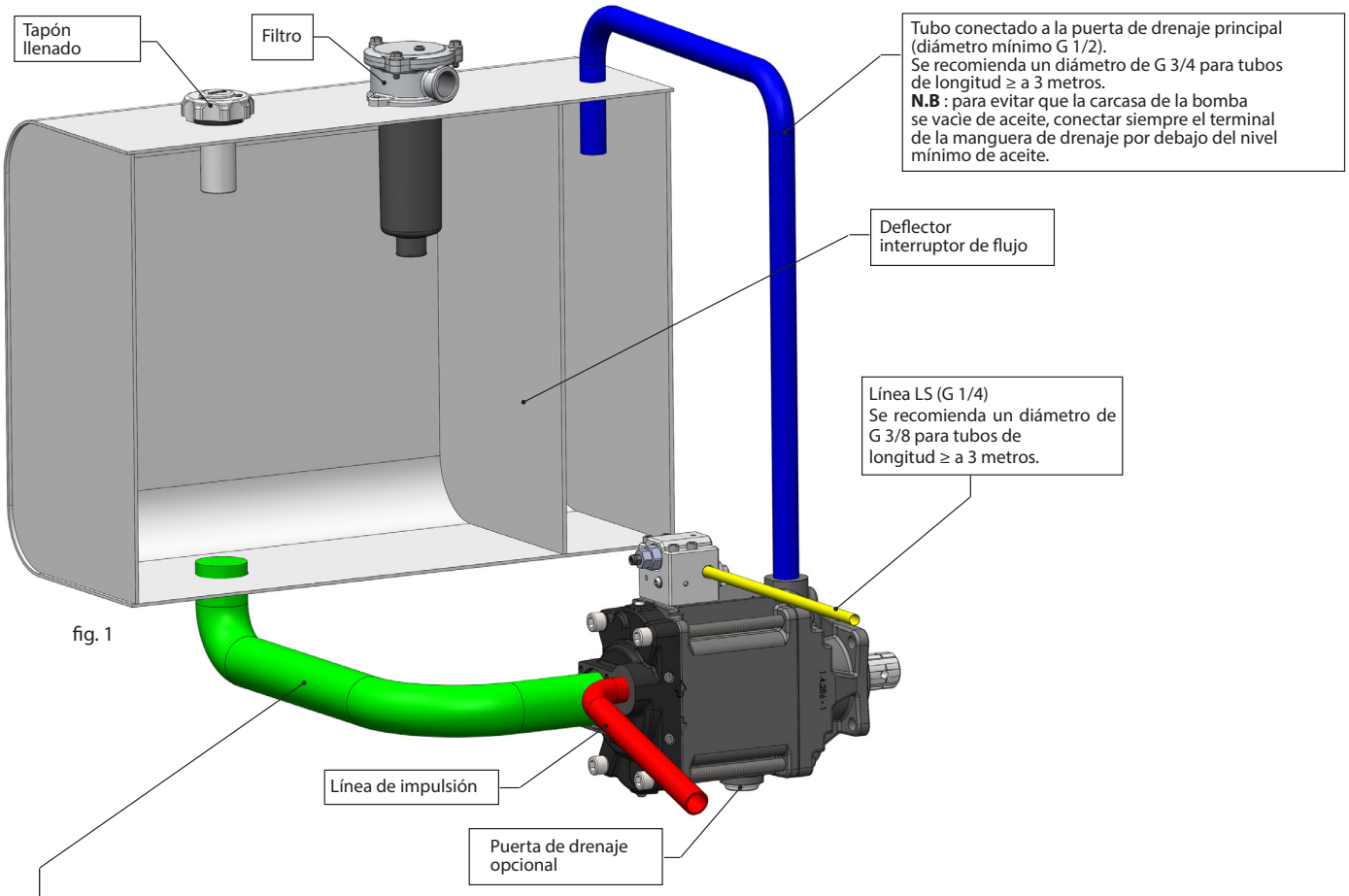


fig. 1

Ø TUBO DE ASPIRACIÓN [mm]									
Serie	Cilindrada [cc]	Velocidad							
		800	1000	1200	1400	1600	1800	2000	2200
PPV	60	50							
	90	50		60					
	110	60					63		
	130	63				76			

FLUIDO HIDRÁULICO					
Fluido hidráulico	Mineral o sintético compatible con las juntas: HNBR				
Temp. permitida	-25 +80 °C				
Viscosidad cinemática recomendada	T media ambiente (°C)	< -40	-40÷10	10÷35	> 35
	VG (cSt = mm²/s)	16	22	32	46
Viscosidad cinemática óptima de funcionamiento	VG= 10 cSt ÷ 100 cSt				
Viscosidad cinemática máxima permitida en la puesta en marcha	VG= 750 cSt				
Índice de viscosidad recomendado	VI > 100				

FILTRACIÓN			
Presión de trabajo (bar)	ΔP<140	140<ΔP<210	ΔP>210
Contaminación de clase NAS 1638	9	8	7
Contaminación de clase ISO 4406-1999	20/18/15	19/17/14	18/16/13
Para conseguir con filtro βx >75 según la ISO 16889	10 µm		

LLENADO	
Antes de la puesta en marcha de la bomba PPV, es necesario llenarla al menos al 80% del volumen máximo.	
Capacidad total PPV 60-90-110	800ml
Capacidad total PPV 130	900ml

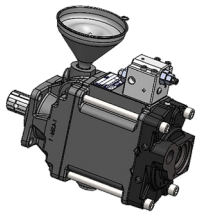


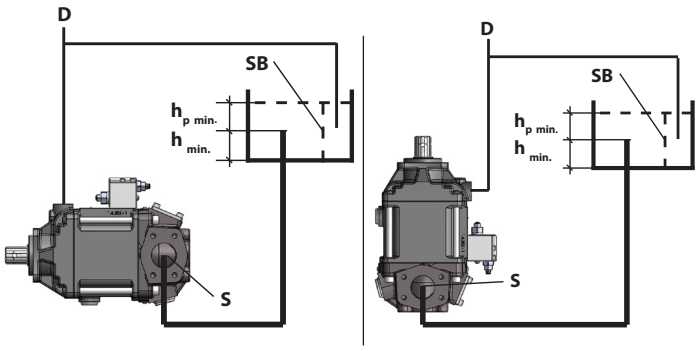
fig. 2

N.B .: nuestro Servicio Técnico está a su completa disposición para cualquier información adicional.

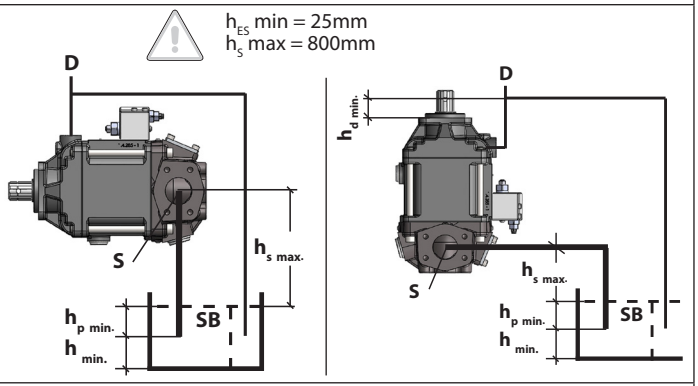
Posiciones de montaje - ajustes

INSTALACIÓN

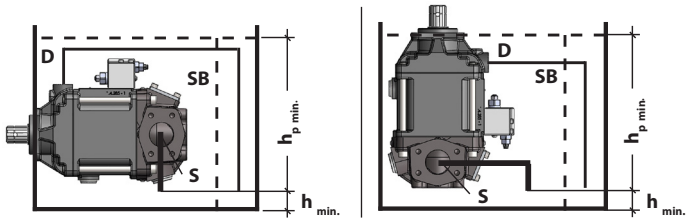
Debajo del depósito (estándar)



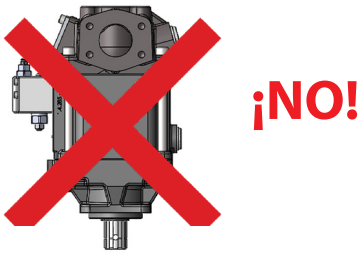
Encima del depósito



Dentro del depósito

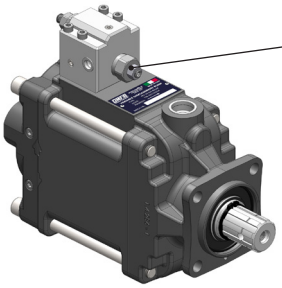


Montaje equivocado



LEYENDA	
D	Llenado / Drenaje
S	Aspiración
SB	Pared de compensación (deflector interruptor de flujo)
$h_{p\ mín.}$	Profundidad de la bomba en el depósito (200 mm)
$h_{mín.}$	Distancia mínima necesaria desde el fondo del depósito (100 mm)
$h_{d\ mín.}$	Altura mínima necesaria para la protección desde que se ha vaciado la PPV (25 mm)
$h_{s\ máx.}$	Altura de aspiración máxima admitida (800 mm)

VÁLVULA LS



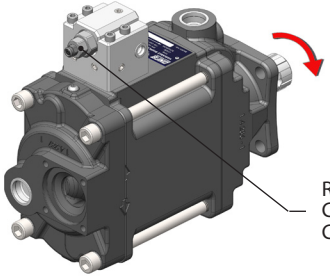
Válvula LS
Calibración estándar: 25 bar
Configuración: 15 bar/rev

13 mm

4 mm

Aumentar la calibración del Load Sensing para incrementar la reactividad de la bomba.

VÁLVULA DE MÁXIMA PRESIÓN



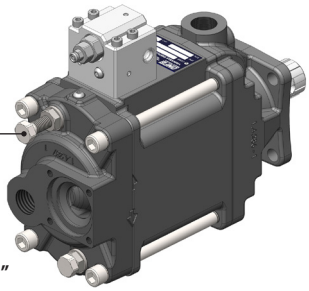
8 mm

2.5 mm

Regulador de presión máxima
Calibración estándar: 330 bar
Configuración: 80 bar/rev

CALIBRACIÓN DE LAS VERSIONES "ADJUSTABLE"

PPV 60-90-110 ADJ



19 mm

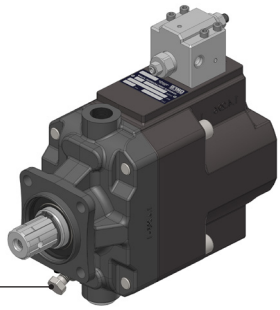
El tornillo de registro posterior "**ADJUSTABLE**" limita la cilindrada máxima de la bomba.

CILINDRADA	60 cc	90 cc	110 cc
Campo de ajuste	40 - 60 cm³	55 - 90 cm³	85 - 110 cm³
Ajuste	4,3 cm³/rev	5,7 cm³/rev	6,6 cm³/rev

PPV 130 ADJ

El tornillo de registro anterior "**ADJUSTABLE**" limita la cilindrada máxima de la bomba.

19 mm



CILINDRADA	130 cc
Campo de ajuste	90 - 130 cm³
Ajuste	12 cm³/rev

1. Vérifier que les composants soient parfaitement propres et qu'il n'y ait pas de contaminants extérieurs.
2. Raccorder les tuyaux (fig. 1) et procéder au remplissage de la pompe (fig. 2).
3. Au premier démarrage, faire fonctionner la pompe pendant au moins 10 minutes à une pression comprise entre 50 et 100 bar.
4. Si nécessaire, procéder aux réglages comme indiqué à la page 3.
5. En présence de basse température, la pompe doit être actionnée sans charge tant que l'huile n'atteint pas une viscosité acceptable.

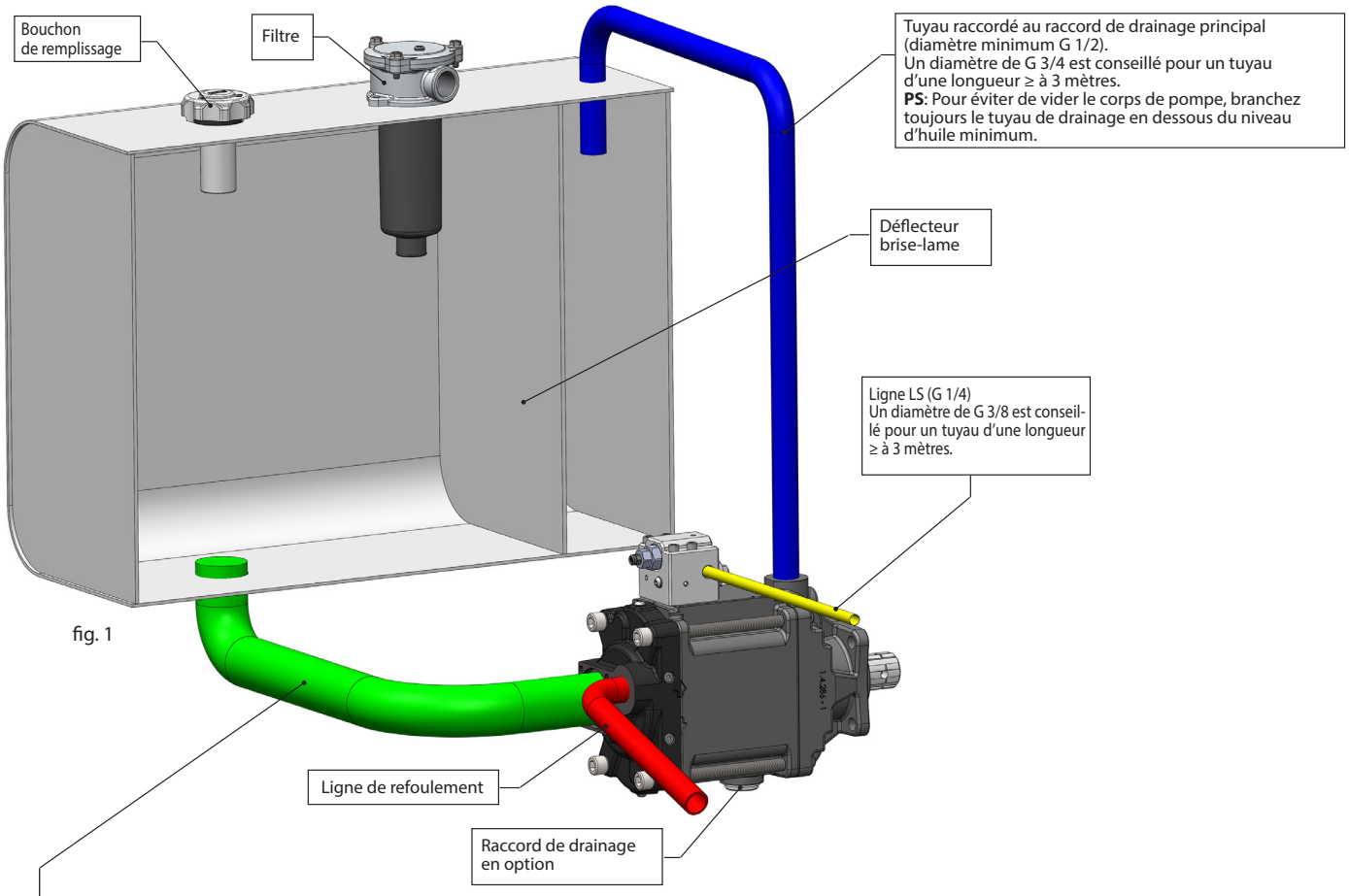


fig. 1

Ø TUYAU D'ASPIRATION [mm]									
Série	Cylindrée [cc]	Vitesse							
		800	1000	1200	1400	1600	1800	2000	2200
PPV	60	50							
	90	50		60					
	110	60					63		
	130	63				76			

FLUIDE HYDRAULIQUE					
Fluide hydraulique	Minéral ou synthétique compatible avec les joints d'étanchéité : HNBR				
Temp. autorisée	-25 +80 °C				
Viscosité cinématique conseillée	T moyenne ambiante (°C)	< -40	-40÷10	10÷35	> 35
	VG (cSt = mm²/s)	16	22	32	46
Viscosité cinématique optimale d'exercice			VG= 10 cSt ÷ 100 cSt		
Viscosité cinématique max autorisée au démarrage			VG= 750 cSt		
Indice de viscosité conseillé			VI > 100		

FILTRATION			
Pression de travail (bar)	ΔP<140	140<ΔP<210	ΔP>210
Contamination classe NAS 1638	9	8	7
Contamination classe ISO 4406-1999	20/18/15	19/17/14	18/16/13
À obtenir avec le filtre βx >75 selon la norme ISO 16889	10 µm		

REMPLISSAGE	
Avant le démarrage de la pompe PPV, il faut remplir cette dernière avec au moins 80 % du volume maximum.	
Capacité totale PPV 60-90-110	800ml
Capacité totale PPV 130	900ml

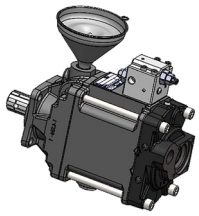


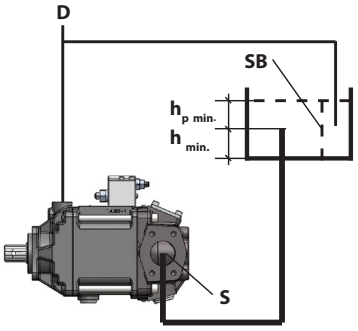
fig. 2

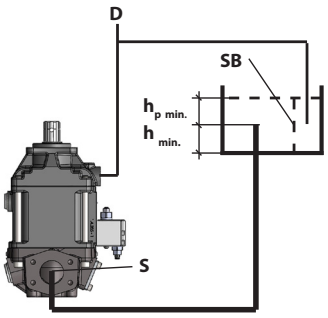
N.B .: notre Service Technique est à votre entière disposition pour tout renseignement complémentaire.

Positions de montage - réglages

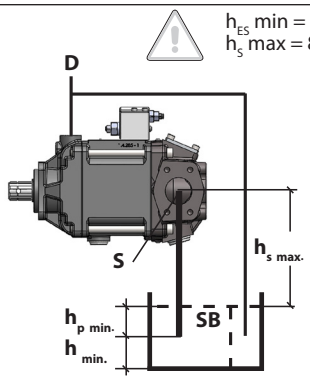
INSTALLATION

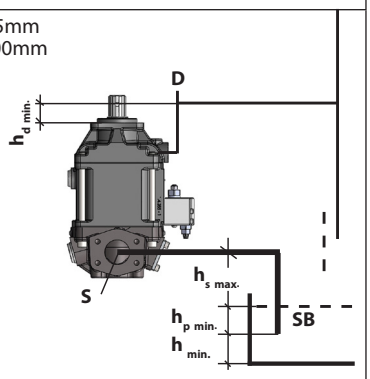
Sous le réservoir (standard)



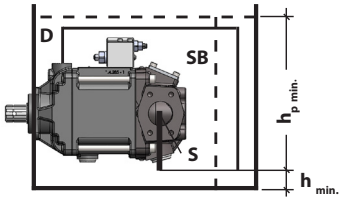


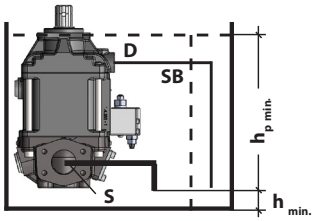
Au-dessus du réservoir



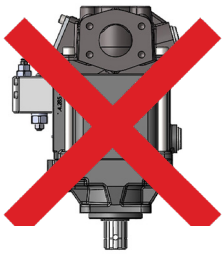


À l'intérieur du réservoir





Montage erroné

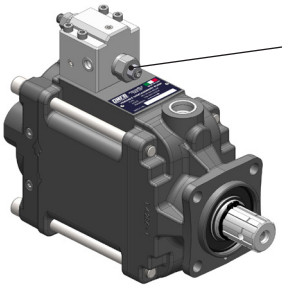


NON !

LÉGENDE

D	Remplissage/Drainage
S	Aspiration
SB	Paroi de compensation (déflecteur brise-lame)
$h_{p\ min.}$	Profondeur de la pompe dans le réservoir (200 mm)
$h_{min.}$	Distance minimum nécessaire du fond du réservoir (100 mm)
$h_{d\ min.}$	Hauteur minimum nécessaire pour la protection du vidage de la PPV (25 mm)
$h_{s\ max.}$	Hauteur d'aspiration maximum autorisée (800 mm)

VANNE LS



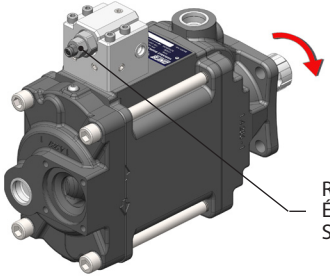
Vanne LS
Étalonnage standard : 25 bar
Setting : 15 bar/rév.

13 mm

4 mm

Aumentar la calibración del Load Sensing para incrementar la reactividad de la bomba.

VANNE DE DÉCHARGE



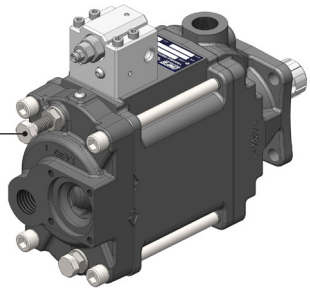
8 mm

2.5 mm

Régulateur de pression maximum
Étalonnage standard : 330 bar
Setting : 80 bar/rév.

ÉTALONNAGE DES VERSIONS « ADJUSTABLE »

PPV 60-90-110 ADJ



19 mm

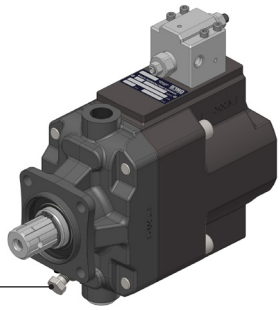
La vis de réglage arrière « **ADJUSTABLE** » limite la cylindrée maximum de la pompe.

CYLINDRÉE	60 cc	90 cc	110 cc
Plage de réglage	40 - 60 cm³	55 - 90 cm³	85 - 110 cm³
Réglage	4,3 cm³/rév	5,7 cm³/rév	6,6 cm³/rév

PPV 130 ADJ

La vis de réglage avant « **ADJUSTABLE** » limite la cylindrée maximum de la pompe.

19 mm



CYLINDRÉE	130 cc
Plage de réglage	90 - 130 cm³
Réglage	12 cm³/rév

1. Sicherstellen, dass die Komponenten sauber und keine externe Schadstoffe vorhanden sind.
2. Die Rohrleitungen (Abb. 1) anschließen und die Pumpe füllen (Abb. 2).
3. Bei der ersten Inbetriebnahme die Pumpe mindestens 10 Minuten bei einem Druck zwischen 50 und 100 bar laufen lassen.
4. Wenn nötig die Einstellungen laut S. 3 vornehmen.
5. Bei niedriger Temperatur muss die Pumpe ohne Last betätigt werden, bis das Öl eine akzeptable Viskosität erreicht.

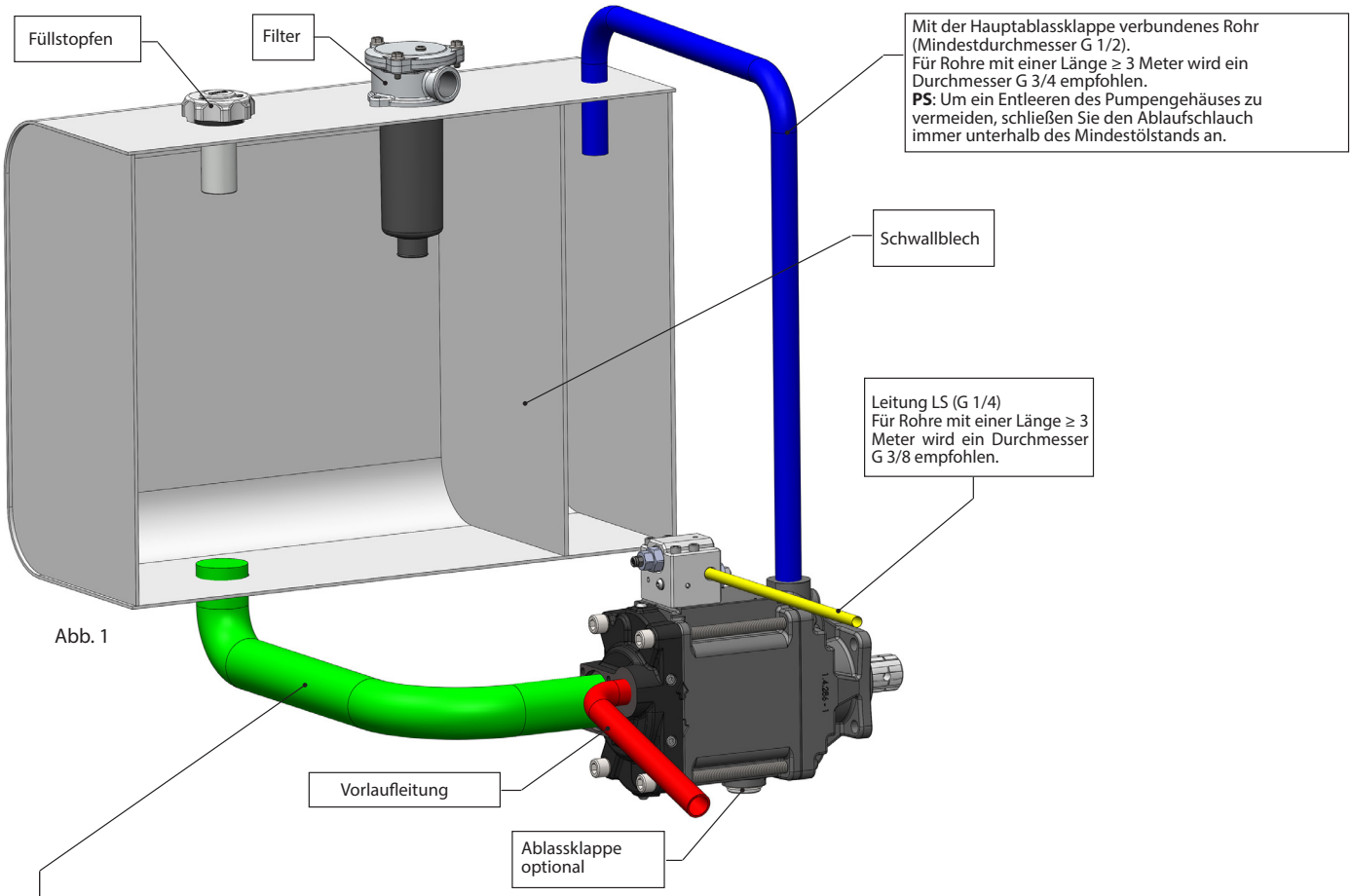


Abb. 1

Ø SAUGLEITUNG [mm]									
Serie	Hub [cc]	Geschwindigkeit							
		800	1000	1200	1400	1600	1800	2000	2200
PPV	60	50							
	90	50		60					
	110	60					63		
	130	63				76			

HYDRAULIKFLÜSSIGKEIT					
Hydraulikflüssigkeit	Mineralisch oder synthetisch, kompatibel mit Dichtungen: HNBR				
Zulässige Temp.	-25 +80 °C				
Empfohlene kinematische Viskosität	Durchschnittliche T Umgebung (°C)	< -40	-40÷10	10÷35	> 35
	VG (cSt = mm²/s)	16	22	32	46
Optimale kinematische Viskosität für den Betrieb			VG= 10 cSt ÷ 100 cSt		
Max. zulässige kinematische Viskosität beim Start			VG= 750 cSt		
Empfohlener Viskositätsindex			VI > 100		

FILTERUNG			
Betriebsdruck (bar)	ΔP<140	140<ΔP<210	ΔP>210
Kontamination Klasse NAS 1638	9	8	7
Kontamination Klasse ISO 4406-1999	20/18/15	19/17/14	18/16/13
Wird erzielt mit Filter βx >75 gemäß ISO 16889	10 µm		

FÜLLEN		
Vor der Inbetriebnahme muss die Pumpe PPV mit mindestens 80 % des maximalen Volumens gefüllt werden.		
	Gesamtfassungsvermögen PPV 60-90-110	800ml
	Gesamtfassungsvermögen PPV 130	900ml

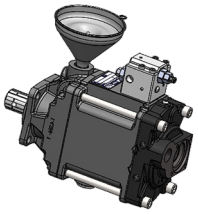


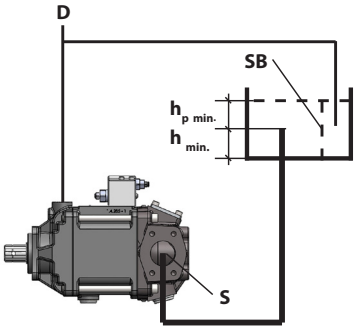
fig. 2

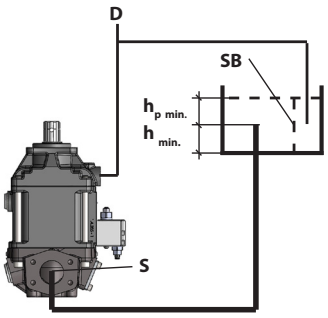
NB: Unser technischer Service steht Ihnen für weitere Informationen zur Verfügung.

Montagepositionen - einstellungen

INSTALLATION

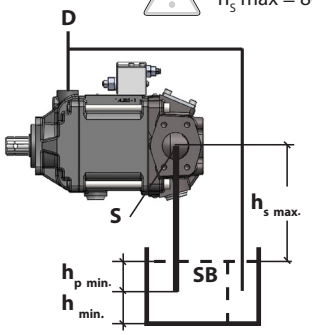
Unter dem Tank (Standard)

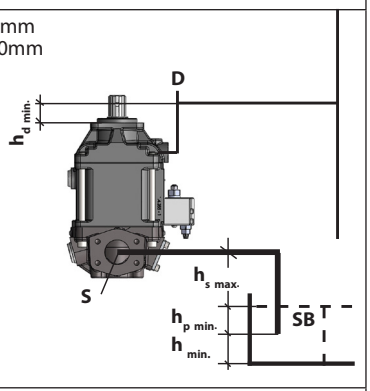




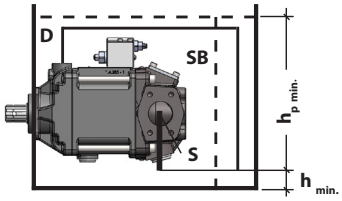
Über dem Tank

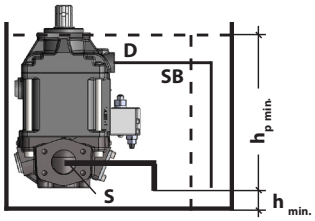
h_{ES} min = 25mm
h_S max = 800mm



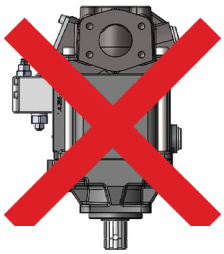


Im Tankinnern





Falsche Montage

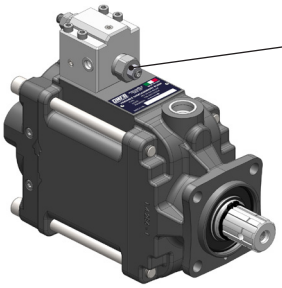


NEIN!

LEGENDE

D	Füllen / Ablass
S	Ansaugung
SB	Ausgleichswand (Schwallblech)
$h_{p\ min.}$	Tiefe der Pumpe im Tank (200 mm)
$h_{min.}$	Erforderlicher Mindestabstand vom Tankboden (100 mm)
$h_{d\ min.}$	Erforderliche min. Höhe für den Schutz vor dem Entleeren der PPV (25 mm)
$h_{s\ max.}$	Zulässige max. Saughöhe (800 mm)

VENTIL LS



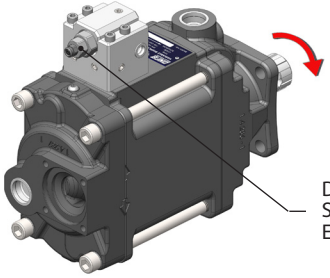
Ventil LS
Standardeichung: 25bar
Einstellung: 15bar/rev.

13 mm

4 mm

Die Eichung des Load Sensing erhöhen, um die Reaktivität der Pumpe zu steigern.

DRUCKBEGRENZUNGSVENTIL



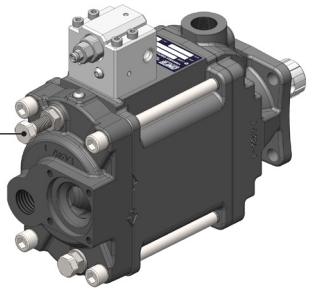
8 mm

2.5 mm

Drucksicherheitsregler
Standardeichung: 330bar
Einstellung: 80 bar/rev.

EICHUNG VERSIONEN „ADJUSTABLE“

PPV 60-90-110 ADJ



19 mm

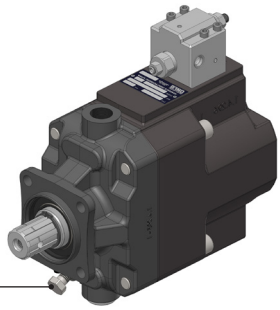
Die hintere Einstellschraube „**ADJUSTABLE**“ beschränkt den maximalen Hub der Pumpe.

HUB	60cc	90cc	110cc
Einstellbereich	40 - 60 cm³	55 - 90 cm³	85 - 110 cm³
Einstellung	4,3 cm³/rev	5,7 cm³/rev	6,6 cm³/rev

PPV 130 ADJ

Die vordere Einstellschraube „**ADJUSTABLE**“ beschränkt den maximalen Hub der Pumpe.

19 mm



HUB	130cc
Einstellbereich	90 - 130 cm³
Einstellung	12 cm³/rev

1. Проверить, что компоненты полностью очищены и отсутствуют следы внешних загрязнений.
2. Подключить трубопровод (рис. 1) и приступить к заполнению насоса (рис. 2).
3. При первом запуске насос должен работать не менее 10 минут при давлении от 50 и до 100 бар.
4. При необходимости выполнить настройки, как указано на стр.3.
5. При низкой температуре насос должен быть подключен без нагрузки, пока масло не достигнет допустимой вязкости.

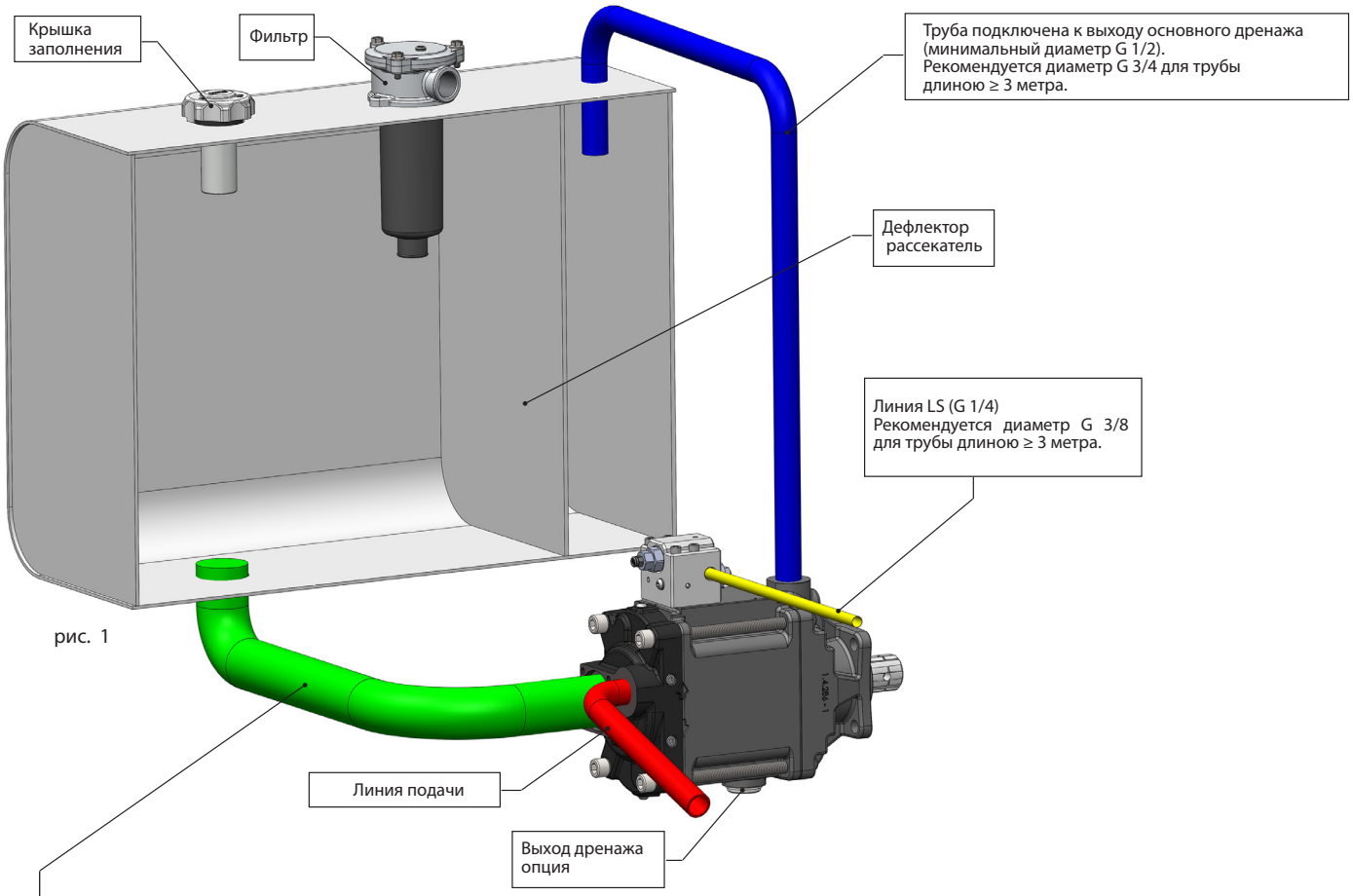
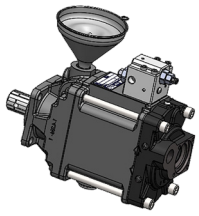


рис. 1

Ø ТРУБА ВСАСЫВАНИЯ [мм]									
Серия	Объём [см3]	Скорость							
		800	1000	1200	1400	1600	1800	2000	2200
PPV	60	50							
	90	50		60					
	110	60					63		
	130	63				76			

ГИДРАВЛИЧЕСКАЯ ЖИДКОСТЬ					
Гидравлическая жидкость	Минеральная или синтетическая, совместимая с уплотнителями: HNBR				
Допустимая температура	-25 +80 °C				
Рекомендованная кинематическая вязкость	T средняя окр.среды (°C)	< -40	-40÷10	10÷35	> 35
	VG (cSt = мм²/с)	16	22	32	46
Оптимальная рабочая кинематическая вязкость			VG= 10 cSt ÷ 100 cSt		
Оптимальная кинематическая вязкость при запуске			VG= 750 cSt		
Рекомендованный коэффициент вязкости			VI > 100		

ФИЛЬТРАЦИЯ			
Рабочее давление (Бар)	ΔP<140	140<ΔP<210	ΔP>210
Загрязнение класса NAS 1638	9	8	7
Загрязнение класса ISO 4406-1999	20/18/15	19/17/14	18/16/13
Достигается с помощью фильтра βx >75 согласно ст. ISO 16889	10 мкм		

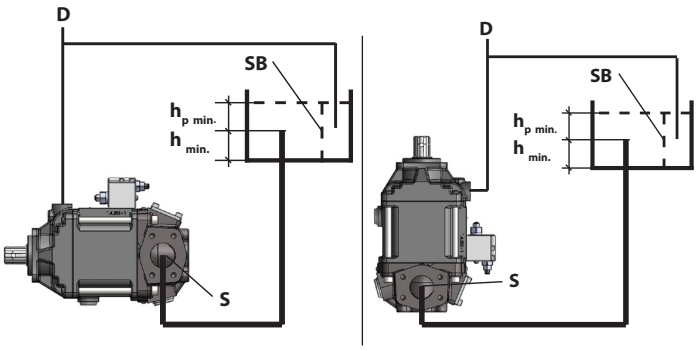
ЗАПОЛНЕНИЕ		
Перед запуском насоса PPV, необходимо заполнить его не менее чем на 80% от максимального объёма.		
 fig. 2	Общий объём PPV 60-90-110	800ml
	Общий объём PPV 130	900ml

Наш технический департамент всегда к вашим услугам по любым интересующим вас вопросам.

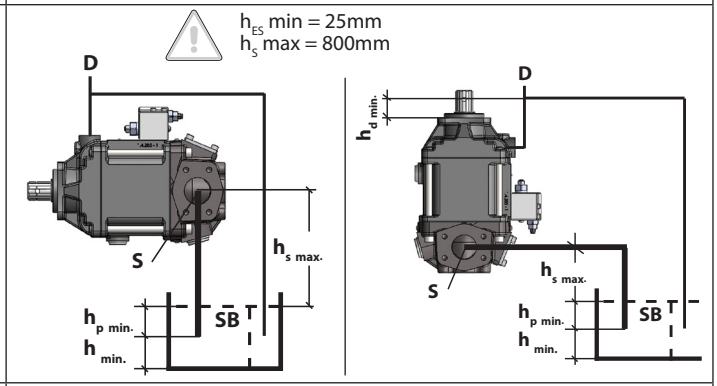
Позиции сборка - настройки

УСТАНОВКА

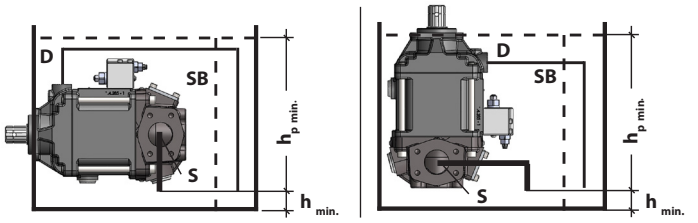
Под баком (стандартная)



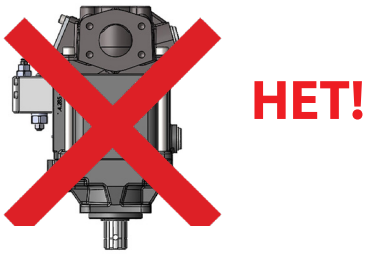
Над баком



Внутри бака

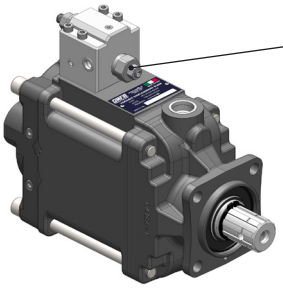


Неправильная сборка



УСЛОВНЫЕ ОБОЗНАЧЕНИЯ	
D	Заполнение / Дренаж
S	Всасывание
SB	Компенсационная перегородка (дефлектор рассекатель)
$h_{p\ мин.}$	Глубина насоса в баке (200 мм)
$h_{мин.}$	Необходимое минимальное расстояние от дна бака (100 мм)
$h_{d\ мин.}$	Минимальная высота, необходимая для защиты от опорожнения PPV (25 мм)
$h_{s\ макс.}$	Максимально допустимая высота всасывания (800 мм)

КЛАПАН ИЗМЕРЕНИЯ НАГРУЗКИ



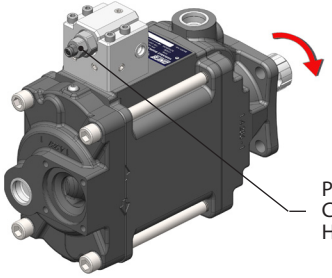
Клапан Измерения Нагрузки
Стандартная настройка: 25 Бар
Настройка: 15 Бар/вер.

13 mm

4 mm

Die Eichung des Load Sensing erhöhen, um die Reaktivität der Pumpe zu steigern.

КЛАПАН МАКСИМАЛЬНОГО ДАВЛЕНИЯ



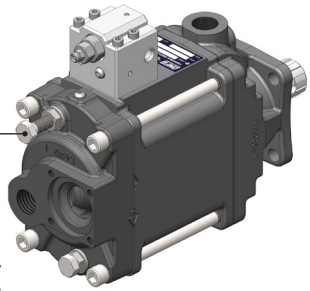
8 mm

2.5 mm

Регулятор максимального давления
Стандартная настройка: 330 Бар
Настройка: 80 Бар/вер.

ТАРИРОВАНИЕ ВЕРСИЙ “ADJUSTABLE”

PPV 60-90-110 ADJ



19 mm

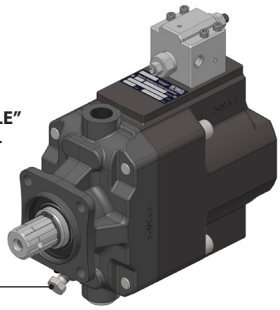
Задний регулирующий винт “**ADJUSTABLE**” ограничивает максимальный объём насоса.

ОБЪЁМ	60 см3	90 см3	110 см3
Диапазон настройки	40 - 60 см³	55 - 90 см³	85 - 110 см³
Настройка	4,3 см³/вер	5,7 см³/вер	6,6 см³/вер

PPV 130 ADJ

Передний регулирующий винт “**ADJUSTABLE**” ограничивает максимальный объём насоса.

19 mm



ОБЪЁМ	130 см3
Диапазон настройки	90 - 130 см³
Настройка	12 см³/вер